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THE WELSH TUBERCULOSIS REPORT

THE Report of the Committee of Enquiry into the Anti-Tuberculosis Services in Wales and Monmouthshire is an admirable document in every way. It grapples with a whole host of facts in a thorough and comprehensive way and throws a great deal of light on the backward and slipshod methods of some of the local Sanitary Authorities in dealing with this and other important public duties committed to their charge. The way in which the Committee started its work was as follows: For some time there had been a growing tendency amongst the County and County Borough Councils to be restive under the increasing demands of the Welsh National Memorial Association for greater and still greater sums towards the tuberculosis service which the Association contracts to give to the whole country. It will be recalled that in Wales the Association, which obtained a Charter of Incorporation in 1912, contracts to maintain a service for the "prevention and eradication of tuberculosis and other diseases, and in particular the provision of treatment in sanatoria or other institutions, or otherwise, for persons suffering from tuberculosis or such other diseases as the Welsh Insurance Commissioners, with the approval of the Treasury, may, in pursuance of the National Insurance Act, 1911, appoint, and the provision, equipment, and maintenance of any such institutions, the promotion of researches, and preventive measures in relation to any such diseases, and such other objects and purposes" as the charter may imply.

The Association has held to this charter and has, on the whole, managed things so tactfully and well that it has made its way without very much opposition from the Local Authorities whom it serves. After 1929 it was decided to budget in relation to "fixed grant periods" of five years, and it was the scheme for the third fixed grant period which has to be discussed and settled with Local Authorities that brought matters to a head. As the Report says, "the percentage, expressed as a percentage of the total

expenditure on public health," is higher in almost all Welsh areas than the average for England and Wales, and for two reasons:

- (1) The comparatively low standard of public health services, and
- (2) The higher incidence of tuberculosis.

It could not be expected that such reasons would necessarily weigh greatly with all Local Authorities in Wales, some of them being responsible for the low standard of public health services mentioned, and the Association considered that it did not get a sufficient hearing at the meeting of authorities at which its estimates were discussed, and which were apparently reduced to a much lower figure than the Association had put in.

The formula for ascertaining the annual contribution to be paid to the Association by each authority was as follows:

"As to 50 per cent. of the amount, in the ratio which the estimated population of the year 1936, of the area of the Council, bears to the total estimated population of Wales and Monmouth for that year.

"And as to the remaining 50 per cent. of such amount, in the ratio which the rateable value of all the hereditaments in the area of the Council bears to the aggregate rateable values of all the hereditaments in the areas of all the Councils, as at the 1st of April, 1936."

The Association decided to appeal to the Minister of Health to nominate a Committee to enquire into the whole matter and to decide whether their claims were extravagant or not; and the Minister agreed, and nominated Mr. Clement Davies, M.P., and Dr. Francis J. H. Coutts as the Committee.

It is to be noted that the Association, under the charter above quoted, is responsible for the treatment of cases and such anti-tuberculosis measures as the creation of Tuberculosis Dispensaries and Clinics. The Local Authorities, on the other hand, continue to be responsible for other measures of prevention, housing, nutrition, schools, disinfection, after-care, etc. There is, perhaps, a difference of opinion as to after-care, which is a matter of the first importance and seems to lie in between the two authorities. The Association, with the hospitals and sanatoria under its control, and also the Tuberculosis Officers, felt that it ought to offer to carry out this work also, the state of things being very bad in regard to it, but the Committee takes the view that the Local Authorities, who are clearly entitled to do it if they can, must be left to tackle the problem of after-care in Wales.

"We are aware," they say, "that there is no statutory obligation on authorities to carry out this work, but we trust and believe that all authorities in Wales will now realise the paramount importance, from every point of view, of setting up an effective care organisation invested with the widest possible powers and equipped with efficient personnel. The assistance

of the Tuberculosis Officer is essential, and he should act either as a member or as medical adviser to the Committee."

Another matter which loses some of its force, falling as it does between the Association and the Councils, is that of Health Visitors. The Association has a certain number of these, described as Area Sisters, who help with the visits of the patients to the dispensary or the clinic and also do a great deal of visiting of the patients in their homes. On the other hand, in certain places, as in the more forward areas, the Health Visitors of the Local Authority, under arrangements by the Medical Officer of Health, take turns to attend the dispensary and visit the houses of the patients for tuberculosis and other things. And there are in certain areas the District Nurses, who are not, however, specially trained in the work of tuberculosis as a house disease. The Committee holds that "it is deplorable that the Association should have had to come forward with a suggestion to extend" the duties of their Area Sisters "to cover work which should be performed by the Local Authorities." It holds that "if unnecessary duplication of function is to be avoided it is most desirable, under existing conditions, that the reports of the Area Sister should be made available to the authority." In the view of the Committee, what should be aimed at is:

- (a) A properly qualified Health Visitor should be appointed by the Local Authority.
- (b) She should visit the home and fill in the form (T₁) in every notified case.
- (c) The form filled up should be sent by her to her superior officer, whether the County or the District Medical Officer of Health.
- (d) The Medical Officer of Health receiving the form should send copies of it to the (1) Tuberculosis Officer and (2) to the other Medical Officer of Health, whether of the county or the district, as the case may be; in that way all three Medical Officers concerned will be fully informed.
- (e) The District Medical Officer of Health should then take the necessary steps to instruct the Sanitary Inspector, who will then carry out his duties.
- (f) The County Medical Officer of Health should inform the Public Assistance or the After-Care Committee, if necessary, and they should then carry out their obligations and take the action desirable.

This will be an excellent arrangement when the bodies concerned are rendered alert or created throughout Wales.

The Committee discusses the project of a new hospital at Swansea, and is, on the whole, very much in favour of an additional new hospital-sanatorium somewhere in the west, perhaps at Swansea. They favour three buildings of this type, two of which already exist: one in North Wales; one in the east of the south, the Sully Hospital; and a third, still to be built, perhaps at Swansea, perhaps at another site more approximate to the population of Carmarthen. The surgical skill for chest operations, which means so much to the consumptive patient, is, at any rate, to be obtained from Swansea, which will therefore have to be at least within easy reach. As to the new Research Laboratory to be built by the Association, but within the Cardiff Royal Infirmary area, the Association supplying the money, the Infirmary the site, and the Medical School the professor and the department, the Committee warmly approves and gives its blessing in no uncertain tone. On the further proposal of the Association to build a Village Settlement in Wales, the contributing authorities being, on the whole, in favour of such a settlement, the Committee says: "The question whether a village settlement should be established in Wales obviously bristles with serious difficulties both for the Association and for the contributing authorities, and requires to be thoroughly explored. We are of opinion that the Association should enquire further to see whether there are ways and means of starting a settlement in Wales and should report fully to the authorities as soon as possible." They speak very favourably, however, of schemes to train male nurses from amongst the men fit for the job at the South Wales Sanatorium; and also speak of a scheme whereby female nurses affected with tuberculosis while with the Association might be retrained and kept according to their capacity for duty when their disease is arrested.

Speaking of disinfection, which is admittedly the duty of the Local Authority, but which in some cases involves applying to the Association for the loan of the steam disinfector of the nearest tuberculosis hospital, a step not very popular amongst some of the poorest and worst equipped authorities, the Committee sums up in favour of the process and describes the three methods which may be used for the disinfection of a house and furniture—namely:

- (1) The burning of a sulphur candle;
- (2) The use of formalin vapour; and
- (3) Thorough washing of the house and furniture with soap and water, with or without some of the common chemical commercial disinfectants.

There may be objections to (1) and (2) under certain circumstances, but (3) is usually satisfactory. They recommend:

- (1) That all clothing and bedding should be removed for steam disinfection, which effectually destroys the tubercle bacillus.
- (2) That in the case of an ordinary house—
 - (a) Where the wall-paper and paint are comparatively fresh, formalin vapour should be used for the time necessary, and after that the walls, where possible, and all the furniture and floors should be scrubbed with or without a commercial disinfectant.
 - (b) Where the paper is old and in several layers the walls should be stripped, then formalin vapour used for the necessary period, and again the walls and furniture thoroughly scrubbed with soap and water, with or without a commercial disinfectant. In the case of a house which cannot be properly sealed, then the walls, where there is paper or other covering such as sacking, should be stripped and the walls, ceiling and floors and furniture thoroughly scrubbed with soap and water, with or without a commercial disinfectant.

This is, after all, a method long advocated by the Association.

The value of treatment of the tuberculous and their education in personal hygiene is also, very rightly, spoken of as one of the principal measures of prophylaxis, and the work that the officers of the Association are doing in this direction is given its meed of praise.

The Committee is obviously very much interested in the racial factor in the genesis of tuberculosis, but takes the attitude that it is dangerous to mention it! "For practical purposes we may safely assume that racial susceptibility *per se* is only a comparatively minor factor in this country. . . . If there is any racial susceptibility, that is surely an additional reason for more vigorous endeavours to deal adequately with other controllable factors. . . . For practical purposes we should ignore the racial factor in considering the measures to be taken against tuberculosis, and do everything possible to combat the fatalistic attitude encouraged by over-emphasis on this point." Nobody supposes that the admission of a fact about tuberculosis can really lead to an attitude of fatalistic slackness about taking precautions; in fact, it is certain, if properly used, to lead to greater struggles against such a formidable foe. The attitude of the Committee on this point is difficult to understand, as they themselves point out how much more serious must be the attitude when this additional danger is freely admitted.

The "waiting list" comes in for a great deal of attention, and rightly,

as it is a recurring feature of comment amongst the Tuberculosis Officers in the Principality. The "actual waiting list" was stated at the last meeting of the Committee in Cardiff to be of the order of 324. It had been hoped that the opening of Sully Hospital would have reduced it considerably, but the fall had been only from 340 to 324. The Tuberculosis Officers were therefore asked to prepare a list of persons suffering from, or suspected to be suffering from, tuberculosis who ought to be in one or other of the residential institutions for observation or treatment. The total came to "the startling figure of 4,872." Of these, 424 patients had left against advice; 301 were not sent forward owing to dearth of beds; 1,024 had refused treatment, etc. This number was reduced by the Association authorities to a potential waiting list of 1,390. When one starts to go into this question of a waiting list one is apt to get rather surprising results. The figure has a bearing on the remark of Dr. Powell, the P.M.O. of the Association, that the number of beds available in Wales is still very much below what it should be.

Let us turn to the facts elicited of how the Local Authorities face up to their side of the question. As to housing, while it is to be freely admitted that county boroughs like Cardiff and counties like Glamorganshire and Monmouthshire do all that is humanly possible to deal adequately with tuberculosis, there are counties either too poor or too slack to do what they might in connection with this disease. The state of things in Anglesea, for instance, is in some respects too terrible for words. When Dr. Glyn Cox was making his survey, the Professor of Tuberculosis went with him to see some of the houses on the island, and was shocked at the state of things revealed. The matter is very well put by Glyn Cox in an account which is published as a good description of what he calls the "old-fashioned Celtic type."

"The house is stone-built, with no damp course. The walls and roof are often limewashed and from the outside have a not unattractive appearance. The building is about 24 feet long by about 9 feet deep. There is one entrance, which is in the middle of the front wall. There are two windows—one on either side of the door. The height of the house to the eaves is about 8 feet. The roof is usually a gabled one. On entering the door it is found that the house is divided into two rooms by a thin partition. One is the living-room or kitchen and the other the sleeping chamber or 'siamber.' . . . There is a grate in the living-room, with sometimes an oven attached. The floor is of earth or mud and lime or stone or slate. Then, often to provide further sleeping accommodation, boards have been put across from wall to wall above the sleeping chamber. This is to provide another room called the grog loft."

Further particulars are given. Frequently a tuberculosis patient is put to sleep in the grog loft, where he lies in a stifling condition till he dies. As the Report says, "it is impossible to disinfect such a place, and after the patient dies someone else occupies the bed; too frequently it is occupied by young children."

This is not peculiar to Anglesea. It is found, with some modifications, in many parts of Wales. In Llandilo, for instance, the Medical Officer of Health is giving evidence.

Q. What is the reaction of your council to your report?

A. All sorts of wires are pulled. Unless a house is really tumbling down there is the greatest difficulty in getting it demolished.

And so it goes on. It is difficult to know whom to blame most, for the councils are as poor as they can be; but it seems that a great deal might be done with the modern system of grants in aid of better houses. One might go on quoting from the Report, but every page contains something worth noting, and it is impossible to do more than mention a few of the outstanding facts.

The Committee goes on to describe the state of the schools in Wales and has a great deal to say about them. They are sometimes as bad as they can be. "Parents are compelled under threat of magisterial penalties to send their children to school, where they remain sitting and working in buildings and under conditions which have been condemned as unsatisfactory and even dangerous to health by the Medical Officers of Health and by the representatives of the Board of Education. And the child is compelled to run that risk in the name of Education." The Committee even recommends the temporary closure of such schools and the leaving of the children for a time without education rather than to "educate" them in such horrible and dangerous conditions. The problem of nutrition is also held to be in need of the closest examination, and the question of how to provide the best kinds of milk and good hot meals is trenchantly dealt with. "If we are to accept the evidence as to the change in the habits as to food during the last fifty years and that the old method of feeding produced a well-nourished and hardy people, we are bound to believe that the present malnutrition is in the main due, not to poverty *per se*, but to use of the wrong type of foods and ignorance of the way to lay out money available for food to the best advantage."

There is no doubt that the Committee is right in speaking of the present nutrition as it does; but the implication that all the faults of the present tuberculosis situation would disappear if the good old days were to return will not bear examination. A glance at Brownlee's figures for 1860 and

onwards will show that tuberculosis was then a much more terrible scourge in Wales than it is at present—many times as great a scourge ! Nutrition may have been much better then, but it did not affect tuberculosis. One must agree with the Committee, however, when they say: " In view of the facts disclosed at our enquiry, it is evident that in Wales, as elsewhere, there is need to educate the housewife in the purchase, preparation, and cooking of food and how to provide suitable and nutritious meals at low prices."

There is much more that one would like to add. The Committee thinks that the poorer districts, and perhaps even the counties, might combine to pay and have the advantages of better officers, and it is obvious that they are right. Where a vacancy occurs for a Medical Officer of Health the authority ought to see that he has a D.P.H. and should make sure that he devotes himself full time to the job. And, we may add, should pay him accordingly—but that is where the difficulty comes in !

There are some very sensible recommendations as to the saving of money designed to be spent on the further extensions or repairs of certain hospitals by the Association. One thing, however, fills us with sorrow: the recommendation that the South Wales Sanatorium should be deprived of the means to develop on lines which would commend themselves to Mr. Morriston Davies for elaborate chest operations. His evidence makes grievous reading. He has been obliged to transfer to other sanatoria the wonderful skill and imagination that makes him supreme amongst those who have devoted their talents to operations such as thoracoplasty and apicolysis. When shall we see the like of him again ? The Report, however, makes fascinating reading, and the members seem to have the happy knack of finding the worst things in Wales and laying them bare with a sort of friendly gusto. We expect to see a great change as the result, and, indeed, a great and thorough change is wanted.

L. C.

GENERAL ARTICLES

THE ASSESSMENT OF PULMONARY TUBERCULOSIS*

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IN describing a case of pulmonary tuberculosis it is desirable to place on record the extent of the disease, the stage to which it has advanced, evidence, if recognisable, of any process of repair of the destroyed lung tissue, and, finally, some measure of the constitutional disturbance.

Extent of the Disease

In the past it was customary to measure the extent of the disease in terms of the lobes involved. This procedure sufficed so long as investigation of the case was limited to physical examination. The introduction of radiography has made it unsatisfactory: the obliquity of the interlobar septa prevents the radiologist from obtaining easily evidence of the extent of lesions in the different lobes. It is more convenient for him, and therefore of greater practical value, to describe the thorax in terms of zones separated by arbitrarily fixed horizontal planes.

Some years ago the late Dr. Stanley Melville and I discussed the definition of these zones; the decision reached and put into practice by him has been adopted so widely that its advantage appears to be beyond dispute. The reasons for selecting the interlobar planes, however, do not seem to have been understood universally. Our plan was based on clinical convenience rather than on anatomical accuracy. Anatomists working on the cadaver refer the level of the various thoracic contents to the dorsal vertebræ as fixed points; radiologists and clinicians, though they deal with the living subject with a thorax constantly moving in respiration, prefer to note the levels in terms of the structures of the anterior chest wall. Extreme accuracy is sacrificed, but the loss is of little practical importance and is compensated by the simplicity of the procedure.

* An introductory lecture delivered at the London Hospital, January, 1939.

THE THREE ZONES.—The zones selected are three in number: the first extending from the apices of the lungs to the level of the second costal cartilage where it articulates with the sternum at the angle of Louis; the second zone extends from the level of the second costal cartilage to that of the fourth where it articulates with the sternum; and the third zone includes all that part of the thorax which lies below the level of the fourth costal cartilage.

The Upper Zone.—The upper zone was termed by Sir Arthur Keith the "operculum thoracis": he pointed out that the movement of the first two ribs in inspiration is purely vertical and increases only the vertical diameter of the thorax without causing any lateral expansion.

The angle of Louis corresponds in the horizontal plane with the body of the fourth dorsal vertebra, and for clinical convenience its level may be marked by the tip of the third vertebral spine.

The chief contents of the upper zone are the apices of the upper lobes of the lungs with the extreme apices of the lower lobes. Between the lungs lie the trachea and œsophagus; in the lower part of the superior mediastinum the arch of the aorta rises into the upper zone, the apex of the concavity corresponding with the angle of Louis. The great vessels rising from the arch and the veins uniting to form the superior vena cava also course through the upper zone.

The Middle Zone.—The ribs from the third to the tenth have a double articulation with the dorsal vertebræ, and the line joining these two articular surfaces if produced forwards would reach the anterior thoracic wall on the opposite side at about the junction of the ribs and costal cartilages. As these ribs rise in inspiration from the inclined position toward the horizontal they move round this oblique axis in the manner of a bucket handle: this eversion of the curved ribs increases the diameter of the thorax at right angles to the axis of rotation and at the same time increases the vertical distance between each pair of ribs. Costal inspiration therefore leads to expansion of the lungs both laterally and vertically in the middle and lower zones.

The motor power is supplied by the external intercostal muscles of one side working in concert with the internal interchondral muscles of the opposite side. The centre from which expansion of the thorax takes place during inspiration is the bifurcation of the trachea immediately below the concavity of the aortic arch. This level corresponds with the angle of Louis and consequently the structures which form the root of the lungs—the bronchi, the pulmonary arteries and veins and the bronchial glands—lie in the middle zone. The lower limit of the middle zone is marked by the fourth costal cartilage. On the right side this indicates the surface

anatomy of the septum between the upper and middle lobes of the lung and on the left side the upper limit of the "incisura cardiaca."

The Lower Zone.—The lower zone contains by far the greatest part of the lungs on both sides, but owing to the domed shape of the diaphragm its exploration by the clinician and radiologist has presented difficulties, though these difficulties have been overcome to a large extent by the introduction of bronchography.

The Stage of the Disease

It is now generally accepted that the primary infection with the tubercle bacillus usually occurs during childhood or adolescence. It is supposed that the site of the primary infection in the majority of cases is in the lung or the intestine, but the site is of little importance seeing that it generally heals spontaneously without giving clinical evidence of its existence. Though the primary focal lesion is negligible the tubercle bacilli are carried to the nearest lymphatic gland; here the infection may be arrested or it may spread further along the lymphatic system, and ultimately reach the thoracic duct and perhaps even the blood stream. Fortunately in almost all cases, at least in civilised communities, the protection afforded by the lymphatic system is efficacious; the primary infection is arrested without causing any disability or leaving any recognisable trace of its occurrence, apart from the fact that henceforth all the tissues of the body will react differently to a fresh infection by tubercle bacilli. Such a secondary infection will now result in an acute focal inflammatory response; this allergy or altered sensitivity is demonstrated by the positive reaction to the von Pirquet, Mantoux, or other tuberculin test.

In the primary infection the tubercle bacilli are not fixed at the point of entry, but are carried to a neighbouring lymphatic gland; in the secondary infection the bacilli are arrested at the point of entry and the lymphatic system is not involved.

The hypothesis is now accepted that pulmonary tuberculosis in the adult is the result of a secondary infection of an individual who has developed allergy as the result of a primary infection in the past.

1. *The Stage of Invasion.*—If tubercle bacilli reach the lung tissue of an individual sensitised by previous infection a localised pneumonia develops round the site of the invasion. This pneumonia may give rise to the first clinical evidence of pulmonary tuberculosis or it may involve a fresh area of lung in a patient in whom the disease is already established. The fate of this allergic response is very variable: often it is of small extent and brief duration; when it subsides the invading bacilli may disappear without leaving any recognisable trace. In other cases the pneumonia may subside

leaving tubercle bacilli, which multiply and give rise to a lesion which may be arrested and encapsuled by fibrous tissue or may gradually extend into the surrounding tissues, which are transformed into caseous material.

2. *The Stage of Consolidation.*—In the second stage the allergic inflammation has disappeared, but has left a caseous focus of tuberculous disease which may undergo arrest or may continue to spread.

3. *The Stage of Softening of the Caseous Material.*—As the disease spreads the caseous material softens and is discharged into the air passages, tubercle bacilli appear in the sputum and the tuberculosis is said to be "open." This stage marks the beginning of "ulceration" or "excavation" of the lung. Some authorities hold that infection of the exposed surfaces by organisms other than the tubercle bacillus henceforth plays an important part in the spread of the disease and the development of symptoms.

4. *The Stage of Cavity Formation.*—The destructive process ultimately leads to the formation of recognisable cavities, and thus the fourth stage is reached.

Fibrosis

Tuberculosis of the lung is essentially a destructive lesion, but in the chronic form it is always associated with indications of repair or of some protection against its spread. The reparative process consists in the formation of fibrous tissue: the tendency of fibrous tissue to contract as it grows older provides the clinical indication of its extent.

The anatomical description of a case of pulmonary tuberculosis is completed by recording the extent in terms of the zones involved, the stage to which the destructive lesion has advanced, and the evidence of repair which can be detected.

The Type of the Disease

Focal Symptoms.—Pulmonary tuberculosis is a local disease, and some of the symptoms are due obviously to the changes at the site of the lesion; they do not, however, usually become prominent or important until the third or fourth anatomical stage has been reached and the tuberculosis become "open."

Constitutional Disturbance.—The disability caused by pulmonary tuberculosis in all the anatomical stages results from the varying degree of constitutional disturbance, and it is a convenient hypothesis to assume that this disturbance results from the absorption into the blood stream of specific toxins from the focus of disease—that is to say, that they depend upon and vary directly with the degree of tuberculous toxæmia. This constitutional

disturbance is made manifest by signs or symptoms; the signs are few but are of importance and are easily recorded—pyrexia, tachycardia, loss of weight, myotatic irritability, and night sweats; the symptoms are numerous and variable—vague aches and pains, loss of energy, inability to concentrate, irritability, insomnia, dyspepsia, etc.—and are usually associated with an exacerbation of the focal symptoms.

The whole symptom complex may be looked upon as a febrile response to the toxæmia. This response, however, does not necessarily give rise to all the signs and symptoms enumerated. Apyrexial fever, for instance, is not uncommon in chronic pulmonary tuberculosis.

Physical or emotional disturbance is recognised to be an important aggravating cause of constitutional symptoms, and rest to the focus of disease is an important element in treatment. Making use of these observations for the purpose of classifying the types of pulmonary tuberculosis, the late Dr. Inman suggested the subdivision of cases into three main groups.

(1) Resting febrile, when constitutional symptoms persist in spite of efforts to secure physical and mental rest.

(2) Resting afebrile but ambulant febrile, when the constitutional symptoms are in abeyance under resting treatment but recur under the strain of slight physical exertion.

(3) Ambulant afebrile, when the constitutional symptoms remain in abeyance in spite of a considerable degree of physical exertion.

The change from a less favourable to a more favourable type under treatment occurs more rapidly and can be recognised more easily than changes in the anatomical extent and stage of the disease.

For the purpose of record of cases of pulmonary tuberculosis, therefore, it is desirable to tabulate—

(a) *The extent* of the disease in each lung in terms of zones.

(b) *The stage* to which the disease has advanced, (1) when “closed” as “invasion or consolidation,” or (2) when “open” as “softening and excavation” or actual “cavity formation.”

(c) The evidence of *fibrosis*, if present.

(d) The type of the disease at the time of observation: (1) resting febrile, (2) resting afebrile but ambulant febrile, (3) ambulant afebrile.

PERICARDIAL EFFUSION IN INFANCY A PROBLEM IN DIAGNOSIS

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THE following case is worthy of record, not only on account of the ætiological problem which it presented, but also as an interesting study in differential diagnosis.

The patient was a boy aged two and a half years, who was brought for medical advice on account of increasing dyspnoea. The history was as follows: The mother's confinement had been normal, and no instruments had been used. Labour had lasted twenty hours. At birth the child was cyanosed, and breathing had been established only with some difficulty. For about ten days there was still some anxiety, as the boy did not take his food satisfactorily, and was often sick; subsequently, however, he made progress and appeared normal and healthy, though the parents noticed a slight difficulty in breathing while he was taking his bottle. When he got to the crawling stage, dyspnoea on exertion was noticeable at times; he would get pale occasionally, but was not cyanosed. In all other respects he appeared a perfectly normal child, and was, in fact, active and energetic.

About the middle of August, 1938, the dyspnoea on exertion became more obvious, and he was taken to a pædiatrician, who advised an X-ray examination of the chest. This showed an extensive opacity, which suggested the possibility of a mediastinal tumour, or, alternatively, of an enlarged heart, and the boy was admitted to the Brompton Hospital for further investigation.

At this time his general condition was good. He was well nourished and appeared healthy and of normal intelligence. The throat was normal, and there was no difficulty in swallowing. There was no change in the voice. The abdomen was slightly protuberant, but nothing abnormal was felt on palpation. The heart sounds were normal, and the pulse rate varied between 110 and 130. The respiration rate averaged 28; the temperature was normal.

On examination of the chest a large area of dullness was apparent in front (Fig. 1), over which there was diminution in the intensity of the breath sounds. On the left side below the clavicle there was a collection of prominent distended veins such as is commonly seen in cases in which pressure

is exerted on one of the main venous trunks by an intrathoracic mass. The dullness and weak breath sounds did not extend below about the fifth rib, the resonance and respiratory murmur below this level being normal. Posteriorly no dullness was apparent and the breath sounds were normal in intensity, being somewhat harsh and broncho-vesicular in character. Two fairly large naevi were found on the posterior aspect of the neck. X-ray examination of the chest at this stage showed the appearances indicated in Fig. 2. The radiologist's report was as follows:

"Heart and mediastinum displaced to the right; the left diaphragm is obscured and depressed. *Left lung* : There is an opacity in the middle and

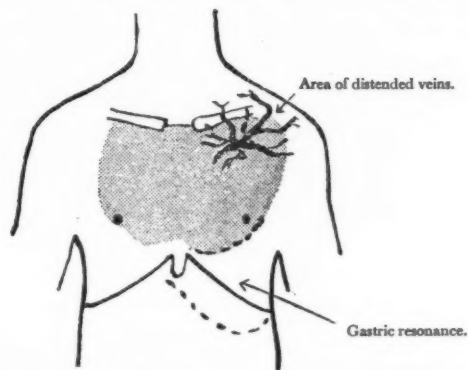


FIG. 1.—ANTERIOR ASPECT OF CHEST, SHOWING AREA OF DULLNESS AND DISTENDED AND ENLARGED VEINS.

lower zones, with a well-defined edge in the middle zone, ? heart, ? neoplasm."

The presence of a congenital heart lesion seemed improbable because of the absence of any abnormality in the cardiac sounds, of cyanosis, or of clubbing of the fingers. It is well recognised that neither cyanosis nor clubbing is essential to a diagnosis of congenital morbus cordis, but such a degree of cardiac enlargement unaccompanied by either of these signs or by murmurs was inconceivable, and a cardiac lesion was on these grounds excluded. The alternative diagnosis of a mediastinal tumour, such as a dermoid or a teratoma, was supported not only by the X-ray appearances but also by the presence of naevi already mentioned, which suggested that the co-existence of other congenital abnormalities was not improbable. The question arose as to whether the opacity shown in the radiogram could be due to the presence of fluid in the chest. The case aroused considerable interest in the hospital, and while the general view was that we were dealing with a mediastinal tumour, the exact nature of which was doubtful, one of

our medical colleagues held firmly to the opinion that there was fluid in the left pleural cavity with displacement of the heart to the right, while one of the senior radiologists was equally convinced that the fluid was in the pericardium. Believing that the diagnosis of mediastinal tumour or cyst was the most likely, I asked Mr. Tudor Edwards to see the boy and to discuss the question of surgical exploration. The point we had to decide at the time was not the necessity of exploration, which I felt was sooner or later inevitable, but the question whether this should be undertaken at once or delayed until the child was a little older, especially as he was not suffering any obvious respiratory disability. Mr. Tudor Edwards agreed with the provisional diagnosis of mediastinal tumour, and laid stress on the recent increase in the dyspnoea which had been observed on extra exertion, as well as the evidence of swelling of the distended veins noticeable whenever the child cried. In view of his opinion that there was a definite risk of the sudden onset of urgent symptoms, it was agreed that the proper course was to explore the chest at the earliest opportunity, and arrangements were made accordingly. The nature of the supposed neoplasm being uncertain (*i.e.*, whether it was solid or partly cystic), it was decided to put in an aspirating needle before opening the thorax. This was done on September 1 under gas and oxygen, and 18 ounces of clear straw-coloured fluid were removed. The radiograms taken after this are seen in Figs. 3, 4, and 5. At the time of the aspiration some air had been introduced and so the level of the residual fluid altered with change in the position of the patient. This seemed to confirm the clinical view that we were dealing with a semi-cystic tumour, the thin wall of which appears in the radiogram. When, however, thoracotomy was performed on September 5 by an anterior incision in the fourth left interspace, free fluid was found in the pleural cavity, and it was evident that no cyst or tumour was present. The thorax was closed without drainage, recovery from the operation being rapid and uneventful.

On September 19 the left side of the chest was again aspirated and 6 ounces of clear fluid were removed. On examination this showed the presence of a few small lymphocytes; bacteriological cultures of the fluid were sterile. The patient was discharged from hospital on September 21.

Within about ten days of the operation it became evident that re-accumulation of fluid in the chest had taken place. This was shown by X-ray examination, although the child showed no signs of distress and his general health continued unimpaired. Later on the dyspnoea reappeared, and the problem of treatment became serious. Mr. Tudor Edwards and I saw him again in consultation with Dr. H. C. Cameron, and the whole matter was discussed at length.

PLATE XXIII

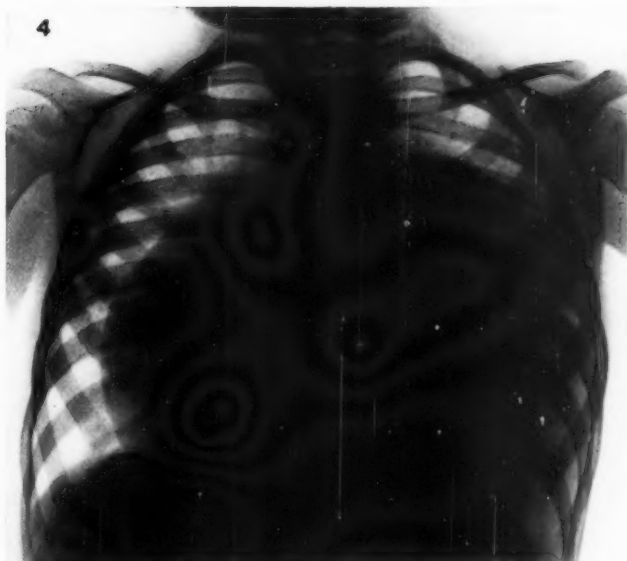


FIG. 2.—RADIOGRAM (AUGUST 29, 1938), ANTERO-POSTERIOR.

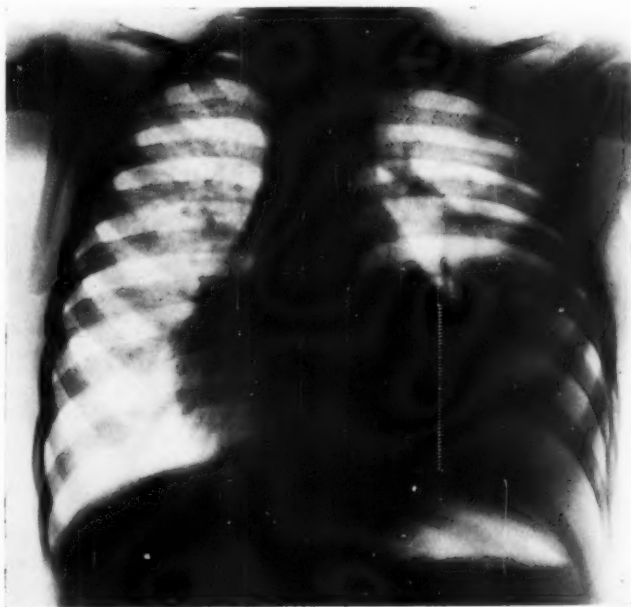


FIG. 3.—RADIOGRAM (SEPTEMBER 2, 1938) AFTER ASPIRATION AND AIR REPLACEMENT (ERECT).

[To face page 140.]

PLATE XXIV



FIG. 4.—As FIG. 3, PATIENT LYING ON RIGHT SIDE.

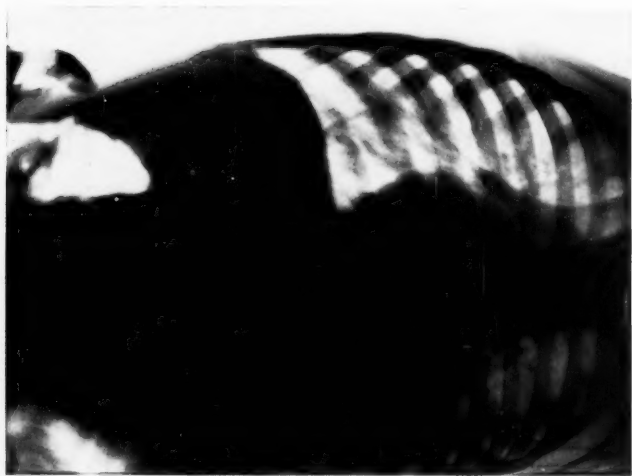


FIG. 5.—As FIG. 3, PATIENT LYING ON LEFT SIDE.

The incidence of primary so-called idiopathic inflammation of the pericardium is admittedly rare. According to Osler it has been met with in children without evidence of rheumatism or of any local or general disease, and certain of these cases are found to be tuberculous. In this instance there was no evidence whatever of any previous rheumatic infection or of heart disease, nor was there any reasonable ground for supposing this child to be tuberculous. It can only be surmised that there was some congenital abnormality of the lymphatic drainage of the pericardial sac. As a possible alternative to this Dr. Cameron suggested that we might be dealing with a very thin-walled pericardial cyst, and that if exploration of the chest had been carried out without previous aspiration of the sac we might have been able to recognise the cyst wall as soon as the incision had been made. In view of the re-accumulation of the fluid it appeared to him that it was imperative to explore a second time on the chance that this view might be correct; if, on the other hand, it was found that we had a simple pericardial effusion, due presumably to some abnormality of drainage, as has just been suggested, we could deal with the condition by endeavouring to make an artificial channel into the pleural cavity, so that drainage could be in some measure established and severe pressure symptoms prevented or at any rate diminished. This seemed to be the only way out of the difficulty, and much to our regret we decided again to explore the chest and to proceed according to circumstances.

The radiogram taken on November 9 showed a large collection of fluid, the appearances being similar to those of the first radiogram (Fig. 2). The physical signs in the chest were similar to those observed originally at the time of the patient's first admission to hospital.

The second operation was performed by Mr. Tudor Edwards on November 30, anaesthesia being maintained by avertin and intratracheal gas and oxygen. The pleural cavity was opened through the original incision. No adhesions were found in the pleural cavity, but the pericardium was distended with fluid. No cyst wall was seen, and it was now obvious that the condition was one of chronic pericardial effusion. The fluid was drained by a small incision in the pericardial sac anterior to the phrenic nerve. A pleuro-pericardial fistula was then made about 1 inch square, the edges being oversewn. The thorax was closed without drainage, and 420 c.c. of air removed by an ordinary pneumothorax apparatus.

On December 6 the chest was aspirated and a few c.c. of almost clear fluid were removed posteriorly. No organisms were found in smears of this fluid, and cultures were sterile. Histological sections of the portion of pericardial wall which was removed showed no abnormality. About three weeks after the last operation there was evidence of further effusion

of fluid, and an attempt was made to aspirate the pericardium through a needle introduced in the axillary line between the fourth and sixth costal cartilages anteriorly, but nothing was obtained except a little blood. Eventually, however, the fluid appears to have been absorbed, and the last radiogram, taken on February 6, 1939 (Fig. 6), showed very much less to be present. Clinically the patient's progress has been uneventful, and he has so far shown no further untoward manifestations.

THE EVIDENCE FOR THE INCIDENCE OF TUBERCULOSIS IN ANCIENT EGYPT

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EVIDENCE concerning the possible occurrence of tuberculosis among the population of ancient Egypt is available to the medical historian from three potential sources, which may be termed respectively the documentary, the archæological, and the anatomical. The first comprises the Egyptian medical papyri, which doubtless embody much of that "wisdom" for which Egypt was traditionally renowned in antiquity; the second comprises certain funerary portraits from the walls of tomb chambers reproduced incidentally in a long series of elaborate publications issued in recent years by the various institutions and individuals who have devoted much labour and money towards the scientific study of Egyptian archæology; the third consists of various technical reports by distinguished professional anatomists, made after meticulous examination of the actual mummified bodies of the ancient Egyptians themselves. Each of these sources will now be briefly reviewed.

Documentary Evidence : The Medical Papyri

The Egyptian medical papyri constitute the oldest medical documents extant, and, though mostly of relatively late (New Kingdom) date, embody a magico-medical knowledge and practice dating back to the earliest historical times. Nearly all are "commonplace books" rather than medical treatises, containing copies of medical passages from earlier prototypes which either have never come to light or have perished utterly. Their contents, as yet imperfectly edited, reveal an intimate association of medicine and magic, well exemplified in the frequent combination of an

PLATE XXV

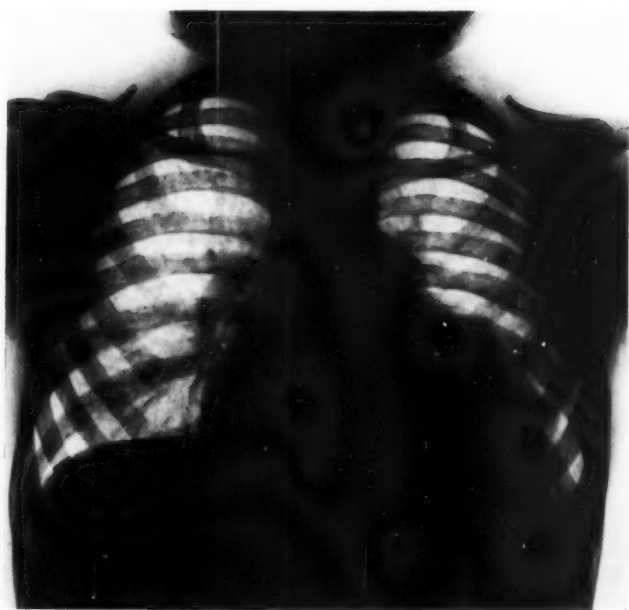


FIG. 6.—RADIOGRAM (FEBRUARY 6, 1939), ANTERO-POSTERIOR.

PLATE XXVI

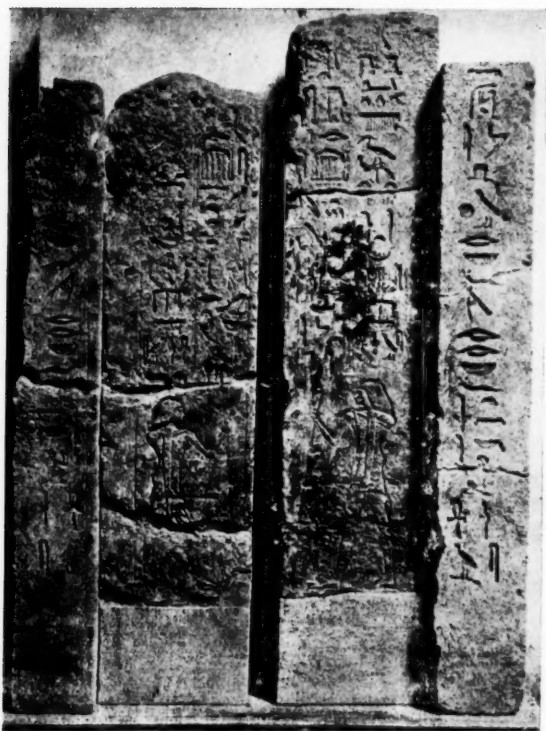


FIG. 1.—FALSE DOOR OF *Mastaba* (GLYPTOTEK NY CARLSBERG, COPENHAGEN).

Figure of Ankh-my-was showing deformity due to tuberculous caries of upper thoracic spine. Note the unusual treatment of the near arm to emphasise the gibbous deformity.

oral rite (incantation) and a manual rite (prescription) in practical therapeutics.

The principal medical papyri may be summarised as follows:

The *Ebers Papyrus* (18th Dynasty) contains, besides numerous spells and incantations, some forty groups of recognisable remedies and prescriptions, some forty-seven cases, and many others of assumed diagnosis. It contains remedies for some twenty stomach disorders; for various intestinal conditions, abdominal pains and swellings; for intestinal worms; for the prevention of vomiting; and for the promotion of digestion. Certain of its sections deal with ophthalmic conditions, others with hepatic and thoracic complaints, others again with such scalp affections as alopecia and fading hair. Fevers and various affections of the mouth, throat, teeth, and tongue are dealt with, as also is otorrhœa. A long series of prescriptions for rheumatic conditions is followed by a gynæcological section, and the papyrus concludes with various household hints and recipes.

The *Hearst Papyrus* (18th Dynasty) closely resembles *Ebers*, and duplicates many of the passages therein. The *Berlin Medical Papyrus* (19th Dynasty) is similar in character to the preceding and very corrupt; it duplicates an obscure passage in *Ebers* describing the physiology of the heart, the great vessels and the pulse. The *London Medical Papyrus* (12th to 13th Dynasties) contains thirty-four gynæcological sections. Its contents are not prescriptions, but directions for treating patients; one section deals with pregnancy and another with sex determination. The *Berlin Papyrus No. 3,027* (18th Dynasty) is largely magical. It contains a score of incantations, with prescriptions intermingled, for defending newborn infants and puerperal women from the powers of evil; it also embodies prescriptions for infants' ailments and two interesting lists of body parts. The *Edwin Smith Papyrus* (18th Dynasty) is of immense interest and importance as the earliest known surgical document and the first truly scientific (*i.e.*, non-magical) medical papyrus so far discovered. Though its scribe has written two magical passages on its back, its text is a genuine clinical consideration of some forty-eight cases of traumatic disease, and its therapeutics are rational. (The text of *Edwin Smith*, the gynæcological parts of the *Kahun Papyrus*, and certain portions of *Ebers*, agree syntactically and in general format, and differ considerably thereby from the other medical papyri. They are all obviously transcriptions from some earlier—and as yet unknown—scientific medical prototype, perhaps that very "Secret Book of the Physician" mentioned in the text of *Edwin Smith*.)

A fragmentary veterinary papyrus is known from Illahun. A medical passage (on the birth of triplets) occurs in the *Westcar Papyrus*. Various prescriptions (*e.g.*, for burns, headaches, stings, and poisons) are interspersed

among the incantations and spells of the *Leiden Magical Papyri*. The *Turin Papyri* (19th and 20th Dynasties) contain a list of all the possible ways death may befall; *Vatican Papyrus No. 36* (20th Dynasty) contains an anatomical list of body parts; and *Louvre Ostrakon No. 3,255* contains four aural prescriptions. Later documents, such as the *London-Leiden Magical Papyrus* (third century A.D.), the *Coptic Medical Papyri*, and the several Greek-written papyri from Oxyrhynchus and elsewhere, are perhaps too alien in character to rank as products of native Egyptian medicine.*

The interpretation of many of the lesions and ailments mentioned in these papyri is fraught with the utmost difficulty—indeed, it is highly doubtful whether the precise pathology underlying some of the clinical conditions described will ever be determined. Though much progress has already been made in the identification of diseases, *materia medica*, therapeutic measures, and the like, a vast amount of specialised collaboration remains yet to be undertaken before even an approximately complete picture of ancient Egyptian medicine may be restored. And whilst it is possible that the signs and symptoms of tuberculous conditions of one sort or another are indeed indicated in various still obscure passages in the medical papyri, yet scientific caution, in the present state of our ignorance, precludes their positive identification.

In brief, the medical papyri, so far as their contents are at present understood, afford no certain documentary evidence of the incidence of tuberculosis amongst the ancient peoples of the Nile Valley.

Archæological Evidence : Tomb Portraits

At all periods the kings and nobles of Egypt took particular delight in maintaining in their courts and households pygmies, dwarfs, hunchbacks, and other malformed persons. Seemingly the leaders of Egyptian expeditions abroad lost no chance in securing either pygmies or dwarfs for the Pharaonic court, for in the tomb of the Old Kingdom noble, Harkhuf, at Aswân, may be read not only the record of a fourth journey he made westward from Southern Nubia in the reign of King Pepy II (6th Dynasty, c. 2600 B.C.), during which a pygmy was secured for the king, but also his royal master's instructions concerning the care to be exercised during the custody of this interesting prize. (These same royal commands make incidental reference to another pygmy previously brought to Egypt by one Burded in the reign of King Isesi of the 5th Dynasty, c. 2700 B.C.) To this peculiar predilection for the bizarre in human form we are indebted for numerous funerary portrait drawings and sculptures on the walls of tombs which form an

* For a further description of these and other papyri consult W. R. Dawson, *Magician and Leech*, London, 1929.

instructive pathological picture gallery of the divers diseases, congenital malformations, and deformities familiar to the people of those remote times. Of such mortuary figures a limited number provide fairly conclusive evidence of the incidence of tuberculosis in ancient Egypt, and for the following reasons: Firstly, physical deformity was of itself no bar to office or advancement in either the civil or religious sphere. King Siptah himself was club-footed and a high priestly official of the 21st Dynasty (Nesperehan) was a tuberculous hunchback. Secondly, whatever obvious bodily deformity a man might suffer had, for magico-religious reasons, to be faithfully represented in his tomb portrait, since the fundamental aim of such portraits required the exact reproduction of the deceased's lineaments and physical attributes. Thirdly, since the Egyptian artist of all periods excelled both in craftsmanship and in fidelity to nature, there is no mistaking his achondroplastic dwarfs, his tuberculous hunchbacks, or his club-footed individuals; his records stand as unintentional but nevertheless valuable contributions to human palæopathology and constitute the earliest representations of human disease.

The first of these mortuary monuments to merit present attention is the false door from a *mastaba* tomb of Old Kingdom date (4th or 5th Dynasty, *c.* 2900 B.C.), now preserved in the Glyptotek Ny Carlsberg, Copenhagen, and bearing two incised portraits of one Ankh-mywas. The deceased is depicted in the canonical funerary stance, his distant arm holding a long staff, his nearer arm bearing a ceremonial mace-like object (see Figs. 1 and 1A). Nevertheless, the sculptor, whilst preserving the requisite formality of posture, has admirably portrayed the dead man's deformity—so obviously the result of tuberculous disease of the upper thoracic spine. Thus the upper part of the torso is rendered excessively convex dorsally and the succeeding thoraco-lumbar region as unduly short and abnormally concave, whilst the sternal region is made unduly prominent. Moreover, in his treatment of the nearer arm the sculptor-artist has cunningly rendered the spinal deformity the more obtrusive; for this arm, springing from the trunk about midway between ventral and dorsal aspects of the thorax, descends in this mid-position over the torso itself, thereby throwing into higher relief the dorsal gibbous deformity. In the portrait of a normal person the nearer arm would arise from a rather angular shoulder at the postero-superior aspect of the thorax and would thence descend behind and parallel to the trunk. There is thus no doubt as to the artist's intention—namely, the accurate delineation of a man who in life had been the victim of tuberculous

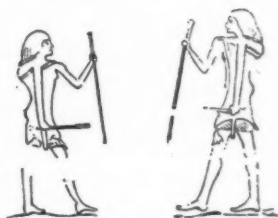


FIG. 1A.—DETAIL OF FIG. 1.

spondylitis of his upper thoracic spine. The typical dorsal deformity, the protuberant sternum, and the telescoping of the thoracic vertebræ are all most convincingly portrayed, and the diagnosis presents no difficulty.



FIG. 2.—ACHONDROPLASIC DWARF, AND (RIGHT) SERVING GIRL SUFFERING FROM POTT'S DISEASE OF THORACIC SPINE, FROM OLD KINGDOM TOMB NEAR GIZA PYRAMIDS (AFTER LEPSIUS).

From a 4th Dynasty nobleman's tomb adjacent to the Giza Pyramids Lepsius¹ has figured the individuals shown in Fig. 2 (*q.v.*)—namely, an achondroplastic dwarf and (right) a humpbacked serving maid. The treatment of this female figure leaves no doubt as to the pathological condition illustrated, clearly tuberculous disease of the mid-thoracic spine. Here again the sterno-costal region is thrust into a prominence altogether absent from the corresponding representations of normally proportioned

individuals, whilst for the purposes of clarity and emphasis the nearer arm is again accorded a scapulo-humeral attachment situate midway from front to back of the thorax. The distant arm (as in the former example) is accorded the customary formal treatment.



FIG. 3.—OLD KINGDOM TOMB SCENE: BOY SUFFERING FROM CERVICO-DORSAL TUBERCULOUS SPONDYLITIS (AFTER SLOMANN).

A third example of Pott's disease of the spine, this time of the cervico-thoracic region, is figured by Sломанн² from a tomb of unspecified period or locality. In this an achondroplastic dwarf leads a cheetah by a rope, and a boy, exhibiting obvious spinal deformity, leads along two leashed hounds. This boy (Fig. 3) presents an obvious kyphosis, or kyphoscoliosis, of his cervico-thoracic spine, his head being so sunk that no neck remains visible; once again the scapulo-humeral attachment of the nearer arm is de-

liberately placed some little way from the dorsal contour of the torso, so that this limb descends over, and not behind, the trunk. In this instance the deformity portrayed is less dramatic than in the first two examples

quoted, but nevertheless no question arises as to either the sculptor's intention or the pathological condition depicted.

The cases just cited hail from the period of the Old Kingdom—*i.e.*, *c.* 2900-2400 B.C. From the Middle Kingdom, however, a further example is known, that from a tomb at Beni Hasan, of 12th Dynasty date (*i.e.*, *c.* 2210 B.C.), described by Newberry.³ The subject this time is a male hunchback, figured in association with a case of talipes equino-varus and an achondroplastic dwarf. Unfortunately, the outline of the hunchback is much damaged, so that details of the sternal region and of the scapulo-humeral articulation are wanting; nevertheless the pronounced kyphosis of the upper thoracic spine is pathognomonic of Pott's disease of the spine (see Fig. 4).

A New Kingdom example of tuberculous spinal caries is furnished by a wall



FIG. 4.—FIGURE OF TUBERCULOUS HUNCHBACK (POTT'S DISEASE OF SPINE), FROM A MIDDLE KINGDOM (12TH DYNASTY) TOMB AT BENI HASAN (AFTER NEWBERRY).

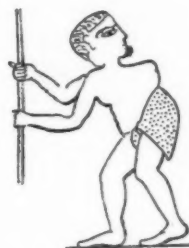


FIG. 5.—GARDENER, VICTIM OF POTT'S DISEASE, WORKING *Shaduf*, FROM TOMB OF IPY AT THEBES, 19TH DYNASTY (AFTER DAWSON).

figure in the Theban tomb of Ipy, of 19th Dynasty date (*c.* 1330 B.C.). This case has been illustrated by Dawson,⁴ whose drawing is reproduced herein (see Fig. 5). The subject in this instance is a markedly kyphotic gardener, clad in a breech-clout, and depicted as engaged in raising water by means of a *shaduf*.

Thus the evidence from archaeology shows that during consecutive dynastic periods in ancient Egypt victims of Pott's disease of the spine were not merely known, but even accorded a special notice, much perhaps as are those modern unfortunates whose sole means of livelihood is the exhibition of their grotesque physical peculiarities to the public gaze. The salient external manifestations of this disease did not escape accurate observation and reproduction by the mortuary sculptor-artists; but that the manifestations themselves were in any way regarded as the products of

disease is highly improbable. A possible objection that such ancient pictures represent the ravages of rickets rather than of tuberculosis is refuted on two grounds. Firstly, by the fact that "no true case of rickets or of syphilitic disease has been found in any ancient Egyptian remains";⁵ and, secondly, by the finding of genuinely tuberculous lesions in such remains.

The Evidence from Human Remains

Egypt has provided the anatomist and the anthropologist, no less than the archæologist and the palæopathologist, with unrivalled opportunities and an unprecedented wealth of material for the prosecution of their respective researches. The Predynastic peoples of the Nile Valley interred their dead, away from the life-giving strip of the cultivation, in the dry sands of the neighbouring desert, wherein, by a process of natural desiccation, such bodies have been remarkably preserved over a period of more than five millennia. So excellent has been this natural preservation of the dead that in many instances the shrivelled relics of such perishable organs as the eye and the brain are clearly recognisable. It is not, however, to be expected that details of morbid conditions, of the viscera at least, should be so correspondingly well preserved or so certainly detectable. Moreover, the distinctively Egyptian practice of mummification, introduced coincidentally with dynastic rule, has conserved for modern investigation examples of Egypt's population from successive phases of a continuous national history which endured for almost forty centuries. In modern times large numbers of such artificially preserved (embalmed) bodies have been submitted to scientific examination and have in consequence yielded much valuable information concerning the antiquity of certain human diseases, particularly of various affections of the skeletal system. But it is otherwise in the matter of visceral disease in general and of visceral tuberculosis in particular. The process of embalming (itself a wholly religious and never in any sense a medical or scientific procedure) necessitated the extraction from the body cavity of all the viscera save the heart, the desiccation of these by fire heat, and their permanent preservation by special treatment with natron, oils, resins, and "spices" of various kinds. The stomach, the intestines, the lungs, and the liver were made into four canonical parcels which were entombed, in various fashion at different historic periods, with the mummy itself. It is not surprising, therefore, that after their subjection to the embalming process the very recognition of the preserved viscera should be, occasionally at least, a matter of some difficulty, and it is obvious that no hope can be entertained of detecting in such mummified organs any unequivocal evidence of pre-existent pathological conditions. Thus, though the craftsmanship of the embalmer succeeded in preserving

unto modern days the viscera of the ancient inhabitants of the Nile Valley, it has achieved this remarkable feat in a manner singularly unfortunate for the student of palæopathology. As will be seen, therefore, the anatomical evidence as to the existence of tuberculosis in ancient Egypt is derived almost wholly from the examination of eviscerated mummified bodies, and is consequently restricted to the more obtrusive manifestations of tuberculous disease of bone.

Examples of such manifestations may now be considered.

Flinders Petrie⁶ reported the finding in a Predynastic cemetery of a skeleton of a hunchback manifesting coalescence of certain vertebræ. But as no particulars are given of the specimen, which was never apparently submitted to expert anatomical or pathological examination, some doubt must remain as to the precise pathology of the case. Whilst spinal caries of tuberculous origin cannot be excluded absolutely, the morbid condition present may equally well have been some form of deforming spinal arthritis—a disease extraordinarily common in Egypt both in Predynastic and in later times, and one whose varied manifestations are capable of causing considerable difficulty in the diagnosis of ancient lesions. (On this point consult Wood Jones⁷ and *Bulletins* 1, 2, and 3 of the *Archæological Survey of Nubia*, Cairo, 1908-09.)

In 1907, during the course of his examination of the human remains obtained by Reisner (on behalf of the Hearst Expedition) from the Old Kingdom necropolis at the Giza Pyramids, Elliot Smith⁸ encountered "the skeleton of a small child with the typical lesion of advanced hip disease which may have been tubercular."

Several instances of undoubted Pott's disease were reported during the extensive excavations undertaken during the Archæological Survey of Nubia, and reference to certain of these must here be made as establishing the undoubted occurrence of tuberculosis of bone at least as far back as the Early Dynastic period (c. 3400 B.C.). Thus Elliot Smith and Derry⁹ record the possible familial incidence of tuberculous caries of the spine from this remote date. For in one Early Dynastic grave the body of an adult male exhibited coalescence of the bodies of the 8th, 9th, and 10th thoracic vertebra which themselves enclosed a large abscess cavity; the body of the 9th thoracic vertebra had been so completely eroded that the 8th vertebra had collapsed upon the subjacent 10th, with a resultant acute kyphosis of the spinal column. The body of a woman (possibly the wife or a relative) from the same grave revealed a large abscess cavity involving the bodies of the upper two sacral segments. From another grave in the same cemetery a man's body showed the 10th thoracic vertebra to be almost completely destroyed by caries, and the 11th vertebra to be also

affected; "the usual collapse of the column had occurred, producing a very acute curvature of the spine." The body of a boy from this same grave showed the lower three thoracic and the upper two lumbar vertebræ to be severely damaged by chronic infective disease and thereby distorted into one irregular mass. Commenting on these particular cases at the time of their discovery Elliot Smith and Derry remarked that "it is more probable than not that they are examples of the destruction wrought by the tubercle bacillus," and they considered "whether the close association of these four cases is a mere coincidence or is evidence of infection perhaps in the members of one family." These specimens were later submitted to expert pathological opinion, which confirmed the tuberculous nature of the lesions present.

In the Middle Kingdom Nubian burial ground at Gennari, on the west bank of the Nile north of Bab-el-Kalabsha, Derry¹⁰ discovered an admirable specimen of Pott's disease in the body of a woman about twenty-one years old. This subject exhibited extensive ulceration of the bodies of the upper three lumbar vertebræ. The second lumbar body had been completely destroyed, with consequent fusion of the remainder of the second vertebra with the first; the latter was so completely displaced forwards that its upper surface faced anteriorly and the bone itself rested upon the upper surface of the third lumbar vertebra. This third lumbar had also suffered considerable erosion of its body, which, with the body of the first lumbar and the neural arch of the second, formed the walls of a large abscess cavity. The severe degree of vertebral caries present had produced the acute spinal curvature typical of Pott's disease (see Fig. 6).

An archaic Nubian body, that of a young man, showed an abscess cavity involving the bodies of the 11th and 12th thoracic vertebræ; the former was almost completely eroded and had collapsed upon the latter, whose central part had been deeply excavated by chronic tuberculous infection. An adult male body of the same site and period revealed almost total destruction of the second lumbar body, and fusion of the 2nd, 3rd, and 4th lumbar vertebræ; the collapse of the destroyed centrum had produced an acute kyphosis at the thoraco-lumbar junction. Derry,¹¹ discussing these morbid changes, cautiously referred to them as "a pathological condition closely resembling, if not identical with, Pott's disease of the vertebræ," but in the light of later and fuller knowledge of Egyptian palæopathology there remains no doubt that the cases in question were true examples of tuberculous disease of the vertebral column.

But undoubtedly the most conclusive proof of the existence of tuberculous spinal caries in ancient Egypt was brought to light during Elliot Smith's examination of a batch of extremely well-made mummies of the members of the powerful 21st Dynasty priesthood of Amûn. For the mummy of

PLATE XXVII

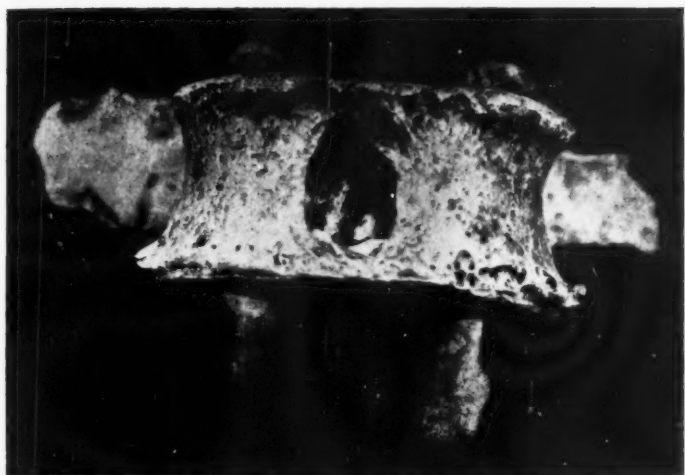


FIG. 6.—LUMBAR VERTEBRA, SHOWING TUBERCULOUS ABSCESS CAVITY IN ITS BODY (MIDDLE KINGDOM PERIOD).

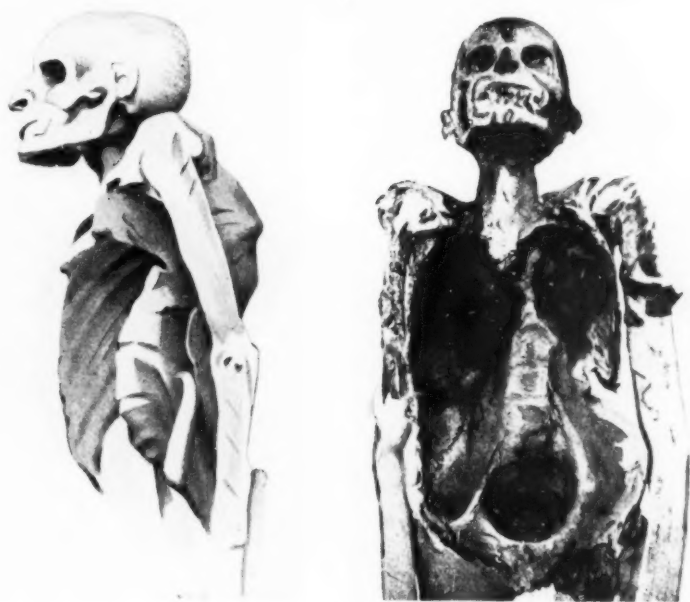
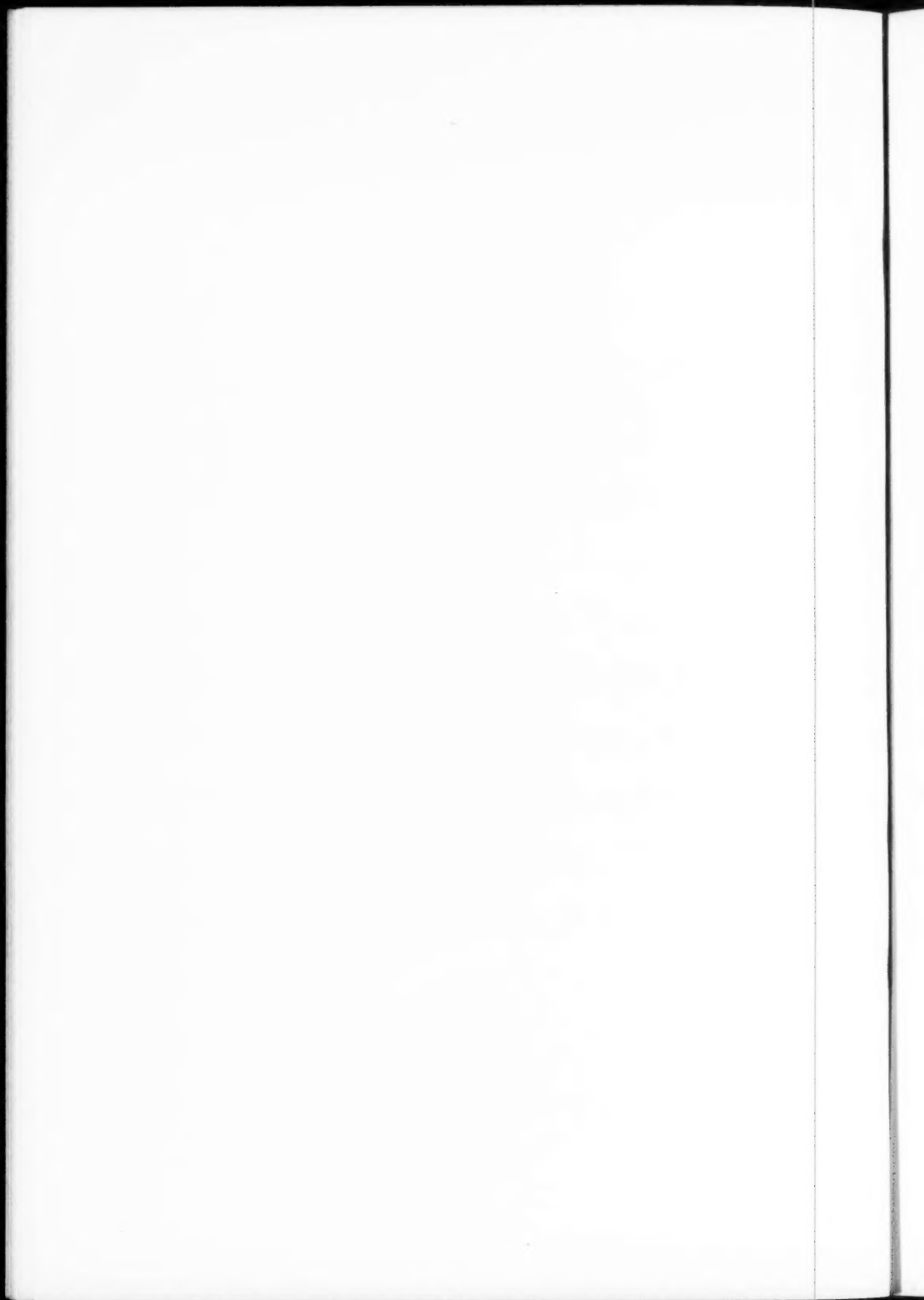


FIG. 7.—THE MUMMY OF NESPEREHÂN, PRIEST OF AMÛN AND HIGH CIVIC DIGNITARY, 21ST DYNASTY.

Tuberculous caries of thoracic spine, psoas abscess and pronounced kyphosis.
(From Elliot Smith and Dawson, *Egyptian Mummies*, 1924.)

[To face page 150.]





one of these high dignitaries, Nesperehan by name, revealed in most obtrusive fashion the clinical signs of Pott's disease of the spine—namely, an excessive deforming kyphosis of the thoracic region, consequent upon marked disease and consequent collapse of the thoracic vertebræ—together with unmistakable evidence of the former existence of a chronic psoas abscess. This most historically important specimen (illustrated here in Fig. 7) has been well described by Elliot Smith and Ruffer,¹² whose account should be consulted for further details. An illuminating sidelight upon contemporary Egyptian opinion is the fact that such severe hunchback deformity did not preclude its victim from the occupancy of the highest sacerdotal office and from the concomitant exercise of civil authority.

The foregoing cases serve to establish beyond all doubt the occurrence of tuberculous disease of bone in ancient Egypt from at least the Early Dynastic period (anterior to 3000 B.C.) onwards. That such disease was prevalent, even sporadically, at a still earlier date in the Nile Valley is highly likely, though as yet no satisfactory evidence is available whereby to determine the point.

Since tuberculosis of bone occurred throughout the dynastic period it is probable, almost to the degree of certainty, that visceral tuberculosis was likewise prevalent, though to what precise extent there are no means of estimating. The sole example of a lesion which *may* have resulted from pulmonary tuberculosis occurred in the mummy of a Nubian woman from a cemetery of Byzantine period on the island of Hesa. In this mummy pleural adhesions were distinctly recognisable; the left lung was collapsed and shrunken and "was firmly bound to the chest wall by a series of old adhesions."¹³ This specimen is suggestive, at least, of tuberculous intra-thoracic disease, but for lack of more adequate knowledge of its true pathology it cannot be considered a proven case of either pleural or pulmonary tuberculosis.

In modern Egypt tuberculosis of one form or another accounts for a small proportion of the country's total deaths. Wood Jones¹⁴ estimated some 5 per cent. of over 300,000 deaths from all causes occurring between the years 1901 to 1907 to be due to this disease.

Summary

The archæological and anatomical evidence detailed above clearly indicates that tuberculosis was one of the several diseases which afflicted the ancient communities of the Nile Valley, and as long ago at least as the third millennium before Christ. That its incidence ranged still further backward in time is highly probable, though as yet unproven. At no period, perhaps, in Egyptian history was tuberculosis a very common disease,

although its visceral manifestations may well have been much more prevalent than can be inferred from the scanty and unsatisfactory nature of the material now available for examination.

The Old Kingdom funerary portraits depicting Pott's disease of the spine constitute the earliest extant illustrations of this malady.

To conclude on a speculative note. Was the tuberculosis of Egyptian antiquity due to the human or to the bovine type of the specific bacillus? Unhappily evidence either for or against the existence of bovine tuberculosis in ancient Egypt is altogether wanting; but it is, perhaps, not without significance that milk was a staple food at all periods of Egypt's history, and that at the opening of the dynastic period the cow was already a long-domesticated animal. Perchance future research may yet determine this question.

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SEASONAL VARIATION IN TUBERCULOUS LESIONS

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(From Southfield Sanatorium Colony, Edinburgh.)

INTRODUCTION.—If tuberculosis is one of those morbid conditions which are affected by seasonal influences, then all manifestations of the disease may well present evidence of seasonal change. In practice, however, it is not possible to observe this process in all tuberculous lesions; seasonal

change is readily detectable only in those forms of tuberculosis which provide visible indications of activity. A striking example of this phenomenon is the seasonal variation recorded by Vieil (1928) and by Levin (1930) in the cutaneous manifestations of the disease. Both these authors found that the lesions were most active in the spring.

The present writer has elsewhere studied seasonal variation in systemic disturbance in tuberculosis (1937). To supplement these observations further enquiry has been made into the effect of seasonal influences on glandular lesions. Two events were selected for examination—namely, the appearance of glandular enlargement in cases in which the glands were palpable in cervical and axillary regions, and the formation of pus in such lesions. This paper deals with the results of this study.

SEASONAL INCIDENCE IN THE APPEARANCE OF GLANDULAR ENLARGEMENT
—Selection of Cases.—The investigations were made on a series of patients undergoing treatment for tuberculosis of the lymphatic system at Southfield Sanatorium Colony, Edinburgh, or at the Tuberculosis Department of the Royal Infirmary, Edinburgh. An attempt was made to ascertain from the records whether the date of the first appearance of glandular swelling could be correlated with any particular time of year. A considerable number of patients, however, were not sure when the swelling was first noticed, and to minimise any error on this account no case was included in the series unless advice as to the nature of the condition was sought within three months of the onset. The following figures are therefore based primarily on the records of 420 patients in whom the duration of glandular enlargement was not greater than three months when the condition was first investigated.

In addition to this number there were also forty-three patients in whom enlargement of the glands was due to reactivation of a tuberculous process which had been latent for a period of time varying from two to twenty years. As there is no reason to think that such relapses should have a seasonal reaction different from any found to be related to an initial activation of the process, these forty-three cases were incorporated in the series. In all, therefore, the date of glandular enlargement was known in 463 cases.

Classification and Results.—These cases were classified according to the month of year in which glandular enlargement began. The results are represented graphically in Fig. 1, which shows the general trend of the seasonal tendency. The peak point, representing the maximum incidence of glandular swelling, was found to occur in January, and was followed by a rapid diminution during the spring months. From the month of May onwards relatively fewer cases were observed, with a minimum number

in August and September. A gradual increase was found during October and November, and a more pronounced increase in December.

Further analysis of the results reveals the fact that 158 of the 463 cases (34.2 per cent.) were the subject of glandular enlargement during January and February, whilst only 35 (7.6 per cent.) were registered during August and September. It may thus be inferred that the initial activity in tuberculous glands begins most commonly in the months of January and February.

THE SEASONAL INCIDENCE OF PUS FORMATION IN GLANDULAR ENLARGEMENT.—The aim of this investigation was to determine at what time



FIG. 1.—THE SEASONAL INCIDENCE OF GLANDULAR ENLARGEMENT IN 463 CASES OF LYMPHATIC TUBERCULOSIS.

of year, if any, the activity of the tuberculous process was most likely to determine the change from caseation to liquefaction. It is well known that caseation may never proceed to liquefaction, or that, on the contrary, it may take any length of time. The causes of this change are still the subject of discussion; the possibility that the seasons of the year may be important was investigated originally by the writer in collaboration with J. C. Simpson (1931), with whom he published preliminary observations.

Selection of Cases.—The sources of the material on which this study was based were the same as those indicated above. Throughout the series the records of patients suffering from glandular tuberculosis were examined for notes relative to the formation of pus in the glands, and the date was

recorded on which the evacuation of pus by aspiration was performed. All patients with doubtful records were excluded from the scope of the investigation. There were many, for example, who presented a history of glandular swelling, followed by operation, since when there had been continued discharge from the wound: such cases were rejected because the discharge might have been provoked by secondary infection of the wound. Likewise patients in whom the affected glands showed softening but did not fluctuate enough to render the aspiration of pus possible were also excluded.

Analysis of Results.—From the records examined it was found that

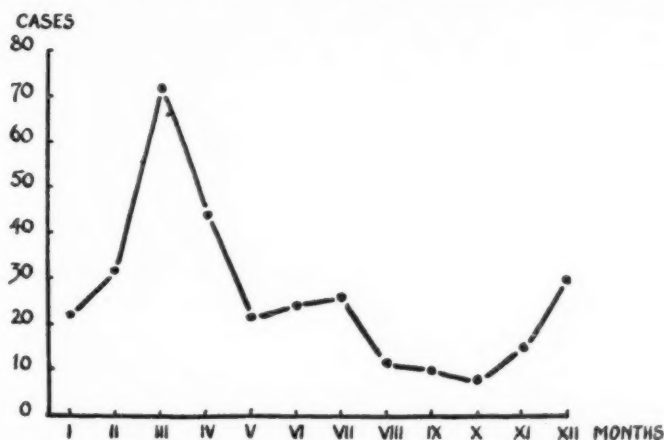


FIG. 2.—THE SEASONAL INCIDENCE OF THE FORMATION OF PUS IN 262 CASES OF LYMPHATIC TUBERCULOSIS.

The total number of occasions on which pus formation was noted was 306, since 44 recurrences are included in this graph.

accurate information was obtained regarding the date of formation of pus in 262 patients. These were classified into twelve groups according to the month of the year in which pus was evacuated. In addition certain recurrences of pus formation were recorded from time to time. In classifying such recurrences it was not considered that a temporary cessation of pus formation, followed by a renewal in a month or two, constituted evidence of seasonal change. But when the lesion had apparently become quiescent, with no evidence of active disease for a period of six months at least, a renewal of activity at the end of that time was regarded as a true exacerbation of the disease liable to influence by any seasonal factor. The season of the year in which relapse occurred was then noted.

In this series of cases forty-four such recurrences were recorded, and thus the total number of occasions on which pus formation was observed was 306. These were classified according to the month of the year in which pus was aspirated, and the results are represented in Fig. 2.

It will be observed that a marked seasonal trend is observable in the formation of pus in glandular tuberculosis. A sharp rise from the beginning of the year to a peak in the month of March shows how commonly aspiration was required at that time. During April the evacuation of pus, although practised much less frequently than in March, was required much more frequently than during the remainder of the year. Formation of pus was relatively uncommon during August, September, and October. During March and April 116 aspirations of pus were performed, or 34 per cent. of the total; conversely, in the three months from August to October evacuation of pus was required on thirty occasions only, or 9.8 per cent. of the total.

SUMMARY.—(1) The initial activation of the tuberculous process as illustrated in the enlargement of lymphatic glands occurs most frequently in January.

(2) The ripening of the tuberculous process as illustrated in the softening of glandular lesions occurs most frequently in March and April.

This paper is a digest of two of the fourteen investigations on Seasonal Variation in Tuberculosis in Man and Animals which the writer submitted as a thesis for the degree of Doctor of Medicine of Edinburgh University. The writer is indebted to the late Professor Sir Robert Philip for permission to analyse the records of Southfield Sanatorium Colony, Edinburgh, and to Dr. A. Fergus Hewat for permission to analyse the records of the Tuberculosis Department of the Royal Infirmary, Edinburgh.

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TUBERCULOSIS OF THE MOUTH

A REVIEW, WITH REPORT OF A CASE OF CHRONIC MILIARY
TUBERCULOSIS COMPLICATED BY THE CONDITION

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INCIDENCE.—Tuberculosis of the mouth is rare. Fishberg (1932), for instance, states that although tuberculous sputum passes through the pharynx, lips, and mouth of phthisical subjects ulceration of these mucous membranes is uncommon. Handfield-Jones (1923), reporting five cases of tuberculosis of the tongue in 1923, gave a history of the literature on the subject from the first description by Portal in 1804. His experience and that of the London General Hospitals of the period was that the condition was rare; and American and Continental figures showed a similar incidence in the countries concerned. Rubin (1927), in an exhaustive paper, referred to Scott's investigation of the literature and his finding of 281 recorded cases up to 1916. He confirmed the rarity of the condition. In a study of 5,000 cases of tuberculosis at the Montefiore Hospital, New York, he discovered only seventy-two with tuberculous lesions of the mouth.

Since the opening of East Fortune Sanatorium in 1921, 1,892 patients with pulmonary disease, 120 of which were readmissions, have been treated; the case described here is the only chronic tuberculous lesion of the mouth which has been observed.

SITES INVOLVED.—Tuberculosis may attack the pharynx, fauces, and the structures of the mouth proper. It is not uncommon to find terminal ulcers of the fauces and tongue in patients moribund with advanced tuberculosis of lungs, larynx, and intestine. Many of these ulcers are doubtless tuberculous, but I am concerned here with chronic tuberculous lesions appearing in patients known to be suffering from chronic tuberculous disease, or occasionally in patients who are presumed to be well. Of these lesions that of the tongue is probably the most common. Tuberculosis of the mucosa of the cheeks is a rare condition: Rubin (1927) records only nine examples among his seventy-two cases of tuberculosis of the lips, mouth, pharynx and tonsils.

THE SOURCE AND TYPES OF INFECTION.—Rubin granted the possibility of a primary infection of the mouth. In a male patient who was admitted to this sanatorium in 1933 with tuberculous disease of the spine and testes, and whose wife had previously been treated here for pulmonary tuberculosis,

the illness started with a chronic ulcer of the tongue, which was excised in Edinburgh Royal Infirmary and found to be tuberculous. That was probably a true chancre d'inoculation. It was, however, Rubin's opinion that these lesions are practically always due to secondary involvement from the lungs, larynx, or lymphatic system. Fishberg (1932), Darlington and Salman (1937), Martin and Koepf (1938), and Ormerod (1937) also regarded them in this light, for a majority of their patients had advanced tuberculosis of the lungs and larynx.

Rubin stated that the commonest types pathologically are the ulcerative, the miliary, and the infiltrative. Less common are the granulomata, tuberculous fissures, cold abscesses, and lupus vulgaris.

PATHOGENESIS.—When a patient is expectorating sputum rich in tubercle bacilli it is easy to postulate an inoculation of the mouth tissues, but the rarity of tuberculosis of the mouth, coupled with the frequency of advanced phthisis, makes this facile explanation not easily acceptable. Rubin pointed out that there are certain inherent properties of the mucous lining of the tongue and mouth which inhibit implantation of the tubercle bacillus; and Handfield-Jones, although stating that inoculation from sputum is the commonest method of infection of the tongue, rather inconsistently explains the rarity of tuberculosis of the organ by its thickness, the resistance of its mucous membrane, the marked antagonism of striated muscle to bacillary invasion, the constant cleansing effect of saliva, and the continuous movements of the tongue. Rubin brought some evidence in favour of the extension of laryngeal tuberculosis to the pharynx and faucial pillars, but he argued in favour of a circulatory transmission in the majority of cases.

Darlington and Salman (1937) discussed this question in detail. Their work followed Rubin's by several years, but was undertaken in the same hospital; it was performed, however, from a dental viewpoint and with different methods and materials. Their findings supported his views on the blood-borne nature of the infection. They reported twenty-two cases of tuberculosis of the mouth, in twelve of which the tuberculous mouth lesion was related to a tooth socket or apex. The remaining ten had mucous membrane tuberculosis affecting the gingiva, palate, or tongue, and there was one case each of tuberculous osteo-myelitis and tuberculous lymphadenitis. The relation of tuberculous mouth ulceration to dental tuberculous infection was also emphasised by Martin and Koepf (1938), who described in detail five cases of mouth tuberculosis, in three of which a deep-seated ulceration had involved the maxillary antrum. They also argued strongly in favour of blood-borne infection.

CLINICAL SIGNS AND SYMPTOMS.—There are, as Rubin has pointed out, different pathological types and the signs depend to a large extent upon the

type present. There may be a chronic indolent ulcer, a granulomatous mass, or a cold abscess, and there are individual varieties of each.

An interesting case was described by Jeanselme, Lefèvre and Willemin (1927), which I quote on account of its similarity to the case which I record. A well-built muscular man reported complaining of a swelling of the inner aspect of his left cheek, which had been diagnosed as being of syphilitic origin. They found a very hard mass of considerable size which bulged the cheek externally and spread backwards from the labial commissure, where it presented as a crusted infiltration. A gland of the size of a hazel nut was present in the left submaxillary area. The buccal surface of the swelling measured 3×1 cm. and was superficially ulcerated. Numerous small greyish granulations bled easily and a greyish-yellow membrane overlay part of the swelling. The basis of the swelling was an infiltration of almost wooden hardness which involved the tissues of the cheek and the gingival fold. The patient had apical pulmonary tuberculosis with tubercle bacilli in his sputum.

Glandular enlargement, described only scantily by the American authors, probably depends upon the degree of secondary infection of the tuberculous lesion. Induration depends upon the type of lesion, and is unlikely to be present in types other than the infiltrative. Martin and Koepf mention its absence in two of their cases and its presence in their fifth case, where a very big indurated infiltrative mass involved the left cheek. Swelling of the cheek and left upper lip was present in this case and was a prominent feature of that described by the French authors.

In tuberculous disease of the pharynx, fauces, and tonsils pain is always severe and, particularly in the first, dysphagia may be extreme. It is often associated with tuberculous laryngitis, which adds to the misery of the unfortunate sufferer. In tuberculous disease of the tongue pain varies with the type of lesion. It may be slight with the tuberculoma and cold abscess; it is always severe with the tuberculous ulcer. Martin and Koepf state that pain is not a prominent feature in tuberculosis of the gums and mucosa of the cheeks, and the case described by Jeanselme, Lefèvre and Willemin was characterised by complete absence of pain. The comparative lack of discomfort caused by these cheek lesions is confirmed by Rubin.

DIAGNOSIS.—There is general agreement that tuberculosis of the mouth is practically always associated with tuberculous disease of some other part of the body, particularly of the lungs, and if the possibility of the condition is kept in mind diagnosis need offer few difficulties. Goadby (1931) mentions in this connection differentiation from chronic traumatic ulceration, sarcomatous growths, granulating ulcers, and epithelioma. If there is doubt biopsy will usually decide the diagnosis and examination of excised

material should always, if possible, be made. There is unanimity among the quoted authors on this point.

PROGNOSIS.—Tuberculous ulceration of the mouth is often a terminal condition and is merely a pointer to the fate of the patient, which is already obvious on other grounds. If the original disease is advanced and progressive the mouth lesions matter little from the prognostic point of view. Darlington and Salman found in their first group, where the ulceration was associated with tooth socket lesions, that the actual prospect of the ulcer healing after efficient dental treatment was good. In their second group the end-results "as to both patient and lesion were appalling," all of the patients traced (eight out of ten) having died in periods ranging from five weeks to two and a half years. Four of the five cases of Martin and Koepf died and the fifth case, which bears a certain resemblance to my own case, made a complete recovery after receiving complete dental treatment. Fishberg states that very few patients with extensive ulceration of the buccal mucous membrane survive for more than two or three months, and Ormerod looks upon mouth tuberculosis as a final failure of the patient's resistance.

TREATMENT.—When the ulceration is a terminal phenomenon treatment at best can only be palliative. This applies particularly to the terminal ulcerations of the palate, fauces, and tonsils, which are usually associated with advanced pulmonary and laryngeal tuberculosis. Ormerod recommends diathermy cauterisation of these ulcers as having, in his experience, a sedative and, if the ulcer is localised, a healing action. Rubin speaks hopelessly of all forms of treatment, and Darlington and Salman, whose work was done from a dental viewpoint, recommend dental treatment. Where the ulceration is related to diseased teeth this is an obvious necessity if the patient's condition otherwise justifies it. The American authors all favour the tentative use of ultra-violet radiation through a quartz applicator.

CASE REPORT—History.—A.B., male, labourer, thirty-two years of age, was admitted to East Fortune Sanatorium in September, 1937. Two months previously he had noticed a swelling of his scrotum which, a month later, was diagnosed as being due to bilateral tuberculous epididymitis. On being questioned he admitted having at night a dry cough, which had appeared coincidentally with the scrotal swelling. His previous health had been good.

Examination.—He was a well-built man of good colour. His height was 5 feet 7½ inches and he weighed 10 stone 12 pounds. His chest moved poorly. There was no dulness and there were no râles, but the breath sounds were everywhere muffled in character. There was gross nodular enlargement of both epididymes and an abscess was present at the lower pole of the right. Both seminal vesicles were enlarged, hard, and nodular.

PLATE XXVIII

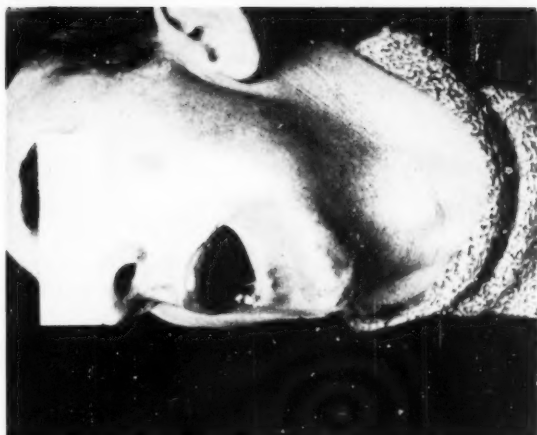


FIG. 2.—SHOWING LESION INVOLVING THE RIGHT LABIAL JUNCTION AND SPREADING ALONG THE BUCCAL SURFACE OF THE RIGHT CHEEK.

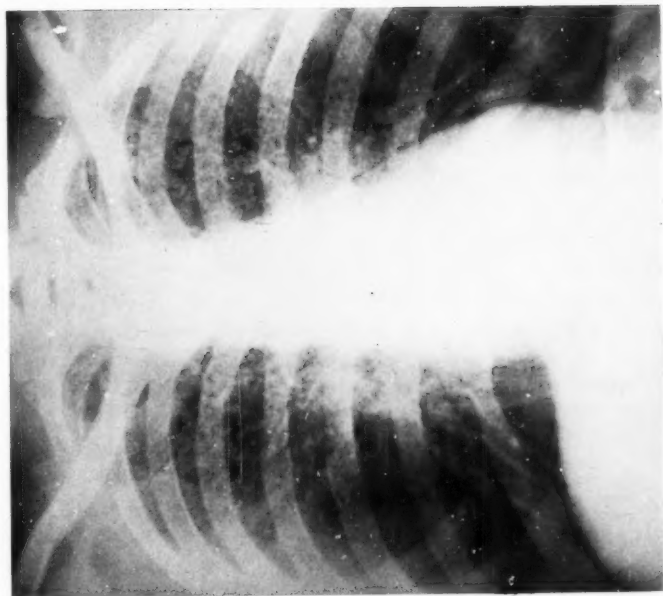


FIG. 1.—SHOWING THE DIFFUSE MILIARY SHADOWING, ESPECIALLY IN THE UPPER HALF OF EACH LUNG.

PLATE XXIX

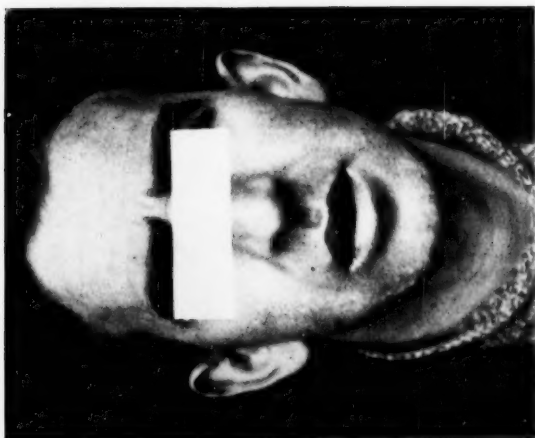


FIG. 3.—SHOWING SWELLING OF THE RIGHT UPPER LIP, SLIGHT SPREADING OF THE INFILTRATION ALONG THE RIGHT LOWER LIP, AND THE EXTERNAL RAISED KELOID-LIKE SWELLING REFERRED TO IN THE TEXT.



FIG. 4.—SHOWING THE COMPLETE CLEARING OF THE PULMONARY SHADOWS.

The lungs remained radiographically clear at the time of his discharge, when he was seriously ill with tuberculous meningitis.

The right was the larger and was slightly tender. The prostate was of normal size and contour. He had no urinary symptoms and his urine was normal. He had complete upper and lower dentures. His gums were clean, but the septic stump of a twelfth right lower molar protruded through the gum and a badly erupted left twelfth molar was present. He gave a ++ reaction to the Mantoux test (1 in 1,000) and his blood sedimentation rate (Westergren one hour) was 70.

The X-ray film of his chest (Fig. 1) showed fine miliary tuberculous shadowing involving the entire lung fields, but most dense in the upper two-thirds of each lung. Shadows in the left lung root resembled calcified glands and a small calcified shadow immediately above the inner third of the right diaphragm suggested an old healed primary focus.

Subsequent Course.—On February 14, 1938, the right side of his face was seen to be swollen. He had no pain and made no complaint. A sinuous ulcer adjoined the right lip commissure. There was a surrounding area of hard infiltration and numerous tiny yellow areas lay in its substance. By the middle of March a wide area of brawny induration involved the mucous and submucous tissues of the right cheek spreading from the angle of the mouth; the commissure and adjacent mouth mucosa were deeply and irregularly indurated (Fig. 2). Smears were made from swabs passed down to the base of the ulcer and on the second examination, on April 1, 1938, acid-fast organisms morphologically identical with tubercle bacilli were found.

Meantime the testicular disease had advanced. The left epididymis broke down and discharged pus and the body of the right testicle became diseased, the organ enlarging to the size of an apple. Enlargement of the prostate appeared, and as a purely symptomatic measure of treatment the right testis was removed on July 4. Histological examination showed the organ to be "grossly involved in a tuberculous process."

During all this time he had had a slight cough and he brought up daily a fractional quantity of thin mucoid sputum in which tubercle bacilli were not found (forty-one examinations). His general condition had improved, and at the time of his operation his weight had increased to 12 stone and his blood sedimentation rate had fallen to 33. By September, 1938, the blood sedimentation rate was 27, and his general improvement was maintained. The mouth ulcer was healing and the infiltration was less. There had been no pain, no salivation, and no glandular enlargement. His temperature and pulse rate throughout had been normal.

During December, 1938, and January, 1939, the ulceration spread and the infiltration tracked along the buccal surface of the right upper lip and down the right cheek to the gingival fold. A raised area like a keloid scar,

well shown on the photograph, appeared to the right of the chin and it looked as if the submucous infiltration had involved the skin (Fig. 3). A little pus appeared in his urine and further breaking-down of the left epididymis took place. In contrast to the progressive activity of these lesions, however, an X-ray examination of his lungs at this time showed a complete clearing of the miliary shadows (Fig. 4). This was confirmed on the day of his discharge, the lungs remaining clear.

His general condition now steadily deteriorated. Symptoms of involvement of the bladder appeared, and on March 14, 1939, tubercle bacilli were found in urinary pus. His temperature and pulse remained normal, but the blood sedimentation rate rose again to 55. Despite the general deterioration the mouth lesion again improved. Ulceration decreased and the infiltration diminished in extent and induration. The condition remained symptomless.

On March 13 he complained of headache, and during the next few days had occasional bouts of vomiting. These symptoms subsided and he passed into a state of somnolence. On March 28 paresis of the left abducens oculi muscle appeared and with it a paresis of the left side of his face. The left pupil was dilated and reacted very sluggishly to light. There was no paralysis or paræsthesia of his limbs. By lumbar puncture cerebro-spinal fluid under slight pressure was run off. The fluid was clear but contained a few tiny filmy clots. The clot, usual in tuberculous meningitis, had formed by the time it reached the laboratory and complete cytological examination was not possible. Tubercle bacilli were not found on smear examination of the clot, but in the meshes of the clot were polymorphonuclear cells. The chlorides were 663 mgm. per cent. and the sugar was 63 mgm. per cent.

His wife insisted on taking him home and he died there a week later, on April 4, 1939. Unfortunately an autopsy could not be obtained.

Treatment.—I do not believe that treatment had any effect upon the mouth condition. As local treatment the ulcers were painted with silver nitrate solution and the area of disease was irradiated with ultra-violet light from a Q.M.V. lamp focused through a cone. Cautious courses of tuberculin (B.E.) and crisalbine were given.

Points of Interest.—Despite the pathological interest of the condition in the mouth it was merely an episode in what was essentially a case of chronic miliary tuberculosis. There can be little doubt that the mouth infection in this case was blood-borne. All the tuberculous lesions were typical of that form of spread. His scanty sputum was never purulent and tubercle bacilli were never found in it. Despite the ulceration and swelling of the mouth the condition was painless, and he ate solid food and used his dentures

during meals. Clinically the lesion was of the infiltrative type, and the fine yellow specks present when our attention was first drawn to it were very like miliary tubercles. Induration, as one would expect, was very definite. There was no glandular enlargement, and the remaining septic stump was clear of the area of disease and had no apparent connection with it. The finding of tubercle bacilli in a direct smear from the ulcerated portion is unusual. The healing of the miliary disease in the lungs and the attempts at healing of the ulcer are significant as illustrating in a remarkable way that in tuberculosis what happens in one part of the body is often no guide to what will happen to coincident disease in another. Actually the lungs were radiologically clear before the onset of meningitis and remained so although this complication supervened. A terminal tuberculous meningitis has been a feature of many of the cases recorded in the literature.

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CONSULTATION

CASE

By R. C. BROCK,

M.S., F.R.C.S.

Mr. C. W., aged thirty years, was first diagnosed as suffering from pulmonary tuberculosis some ten years ago, at the end of 1928. His history until the time of consultation is best outlined as follows:

In December, 1928, he developed cough and sputum, and the latter was found to be T.B. positive. In March, 1929, he was at a sanatorium; the disease was bilateral, although worse on the left side. A left A.P. was induced. Collapse was incomplete and an attempt made to divide adhesions at the left apex was only partly successful. In spite of this, however, he did well, and by October, 1931, all cough and sputum had ceased. He later returned to work as a bank-clerk, and in September, 1933, the left A.P. was abandoned. He now enjoyed good health until September, 1936, when cough and sputum returned and radiography revealed a cavity in the left upper lobe with infiltration around it.

He was seen by Dr. Burrell, who advised an attempt to re-establish the left A.P. In March, 1937, this was attempted again and obtained. The collapse was, however, still incomplete, and at Dr. Burrell's request I performed thoracoscopy and divided a large laterally placed adhesion; an adhesion at the inner apex seemed indivisible and was left.

In July, 1937, although he was very well in himself and the pneumothorax was reasonably good, his sputum still contained T.B. and a penetrating radiograph showed that the cavity in the left upper lobe, although reduced to a mere slit, was still patent. Thoracoscopy was repeated, but the apical adhesions suspending the diseased area were quite indivisible.

The history up till this time, therefore, is of a common type, apparently successful treatment by what was really an incomplete pneumothorax being followed after several years by a relapse. Of definite interest is the re-establishment of the pneumothorax and its improvement by further cauterisation. The improvement was, however, inadequate, as shown by the persistence of positive sputum and non-closure of the cavity.

In view of these facts Dr. Burrell advised the patient to undergo a thoracoplasty. As he felt so well the patient refused the operation at that time and went to Switzerland.

In October, 1937, he again saw Dr. Burrell, who found the state of affairs much as before, and stated that he saw no reason to change his former advice about thoracoplasty. The patient again refused, and returned to Switzerland.

In December, 1937, fluid appeared in the left pneumothorax, and rapid obliteration followed accompanied by a return of all symptoms, increase of amount of sputum and increase in size of the cavity in the left lung, and general deterioration of health.

In March, 1938, the patient wrote home stating that he was now prepared to have a thoracoplasty. He was told that a completely fresh assessment would have to be made, and for this purpose he was seen in May, 1938. He was now bringing up about 1 ounce of positive sputum per day, and during the previous few weeks had had several bouts of fever. He was pyrexial, and in addition to the signs of disease in the left lung there were signs of recent active spread in the *right* lower lobe, as shown by impaired percussion and showers of râles. A radiograph showed a large cavity the size of a hen's egg in the left upper lobe with much surrounding infiltration, and a considerable patch of recent tuberculous disease in the right lower lobe. Owing to Dr. Burrell's illness he was seen in consultation with Dr. Livingstone, who recommended absolute rest in bed, to be followed by a right A.P. if the disease on the right side failed to improve after a month.

In June, 1938, owing to radiological evidence of further infiltration in the right lung, a *right* A.P. was induced successfully.

It is of interest to pause here and consider the lesson to be learnt, one that cannot perhaps be better conveyed than by quoting the patient's own words when the position was explained to him: "What a fool I have been; if only I had taken Dr. Burrell's advice about the thoracoplasty last summer I might have been all right by now."

There had now been a complete change from the state of mind of refusing thoracoplasty to one of bitter disappointment at being refused it and eagerness to be ready for the operation at the earliest possible moment.

In October, 1938, in spite of complete rest in bed and continuance of the right A.P., he had made no improvement, and in fact had definitely deteriorated. Sputum was still 1 ounce and positive; there was occasional pyrexia. He stated that he was sure he was not going to get well if he continued as he was and demanded thoracoplasty whatever the risk.

He was seen in consultation with Dr. F. H. Young and the pulmonary condition at this time is shown in Fig. 1. Infiltration was present in

the lower and middle lobes on the right, larger in amount than in June, and covered by a controlling pneumothorax. The condition of the left lung was definitely worse than before; the cavity in the upper lobe was much larger and infiltration extended throughout the whole of the lung. The sedimentation rate was 23 mm. in the first hour.

The problem that presented was a very difficult one. The lesion on the left side really demanded thoracoplasty, and the involvement of the whole lung pointed to the need for a total collapse. The amount of active disease on the right lung, and the need for maintaining a good controlling pneumothorax, coupled with the patient's poor general condition, seemed absolutely to contra-indicate thoracoplasty as an operation holding out any safety at all. Collapse of the large cavity on the left side was, however, urgently called for. Further delay seemed unjustified, as five months of complete rest with the right A.P. had achieved practically nothing.

Extrapleural pneumothorax was the other alternative, but this also seemed an undesirable procedure owing to the extent and chronicity of the disease and the large size and superficial nature of the cavity. In general the operation is a dangerous one in these cases, carrying a grave risk of death from bleeding or secondary infection.

As there appeared no alternative it was decided that the risk of the operation was not sufficient to weigh against the almost certain disaster that would follow further conservative treatment. The patient was only too willing to accept the risk, and accordingly extrapleural pneumothorax was agreed upon.

Under local anaesthesia a wide and satisfactory extrapleural pneumothorax was obtained. The disturbance from the operation was minimal and recovery so rapid that he was ready to leave for a sanatorium in little more than three weeks. It was never necessary to aspirate fluid. The satisfactory nature of the collapse obtained is shown in Fig. 2; the extrapleural pneumothorax extends down to the ninth rib.

In May, 1939, Dr. Wingfield reports: "Mr. C. W. is now discharged. He has done very well and appears to be quite stable on our Grade 4, with slight cough and very occasional sputum, which is always negative to smear examination, but from which T.B. were cultured. The extrapleural and intrapleural A.P.s are running very satisfactorily."

PLATE XXX



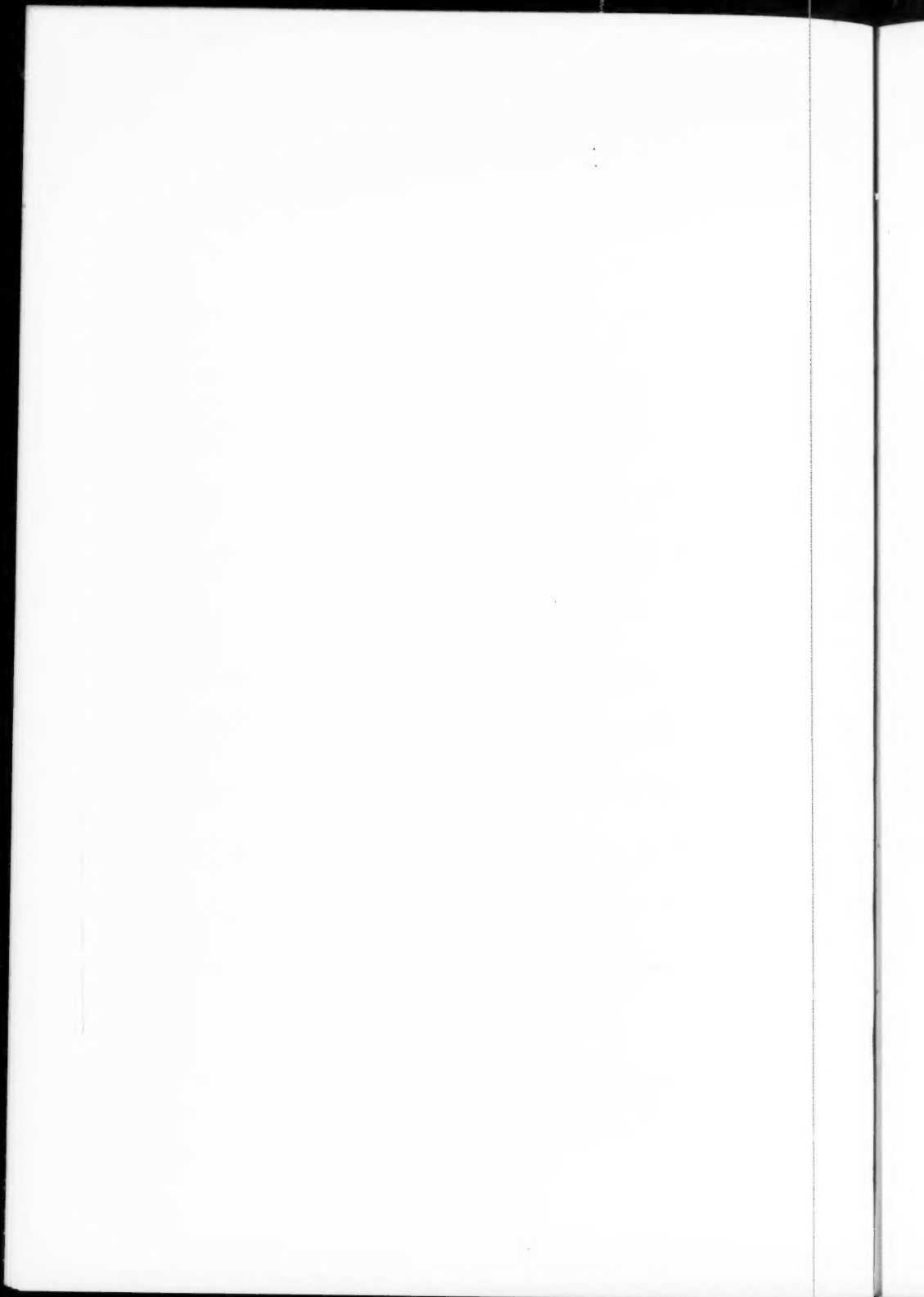
FIG. 1.—RADIOGRAPH IN OCTOBER, 1938, SHOWING RIGHT INTRAPLEURAL A.P., LARGE CAVITY AND EXTENSIVE INFILTRATION ON LEFT.



FIG. 2.—RADIOGRAPH IN DECEMBER, 1938. The large cavity seems to have been satisfactorily controlled by the extrapleural A.P. on the left which extends down to the ninth rib.

[To face page 166.]





MEETINGS OF SOCIETIES

JOINT TUBERCULOSIS COUNCIL

A MEETING of the Joint Tuberculosis Council was held at the London School of Hygiene and Tropical Medicine on Saturday, May 20, 1939.

The North-Western Tuberculosis Society announced that the annual subscription to the Council would in future be four guineas instead of two as formerly. Dr. R. R. Trail was appointed by the British Medical Association to fill the vacancy on the Council occasioned by the death of Dr. F. W. Goodbody, and Sir Percival H. S. Hartley was cordially welcomed to the Council as the representative of the National Association for the Prevention of Tuberculosis in place of Dr. J. F. C. Coutts, resigned. The Faculty of Radiologists accepted representation on the Council.

A memorandum prepared by the Secretary-General of the National Association for the Prevention of Tuberculosis, indicating a number of ways in which closer co-operation between the National Association, the Tuberculosis Association and the Joint Council was possible, was considered by the Council, and it was agreed to appoint the Chairman (Dr. S. Vere Pearson), Sir W. W. Jameson, Dr. E. Ward, Dr. G. Jessel (Hon. Treasurer), and Dr. J. B. McDougall (Hon. Secretary) to meet members of the other two organisations to discuss the matter further and report back to the Council.

The Committee work of the Council was surveyed and the following Committees were appointed.

Gold.—Dr. R. L. Midgley (Convener).

Employment and After Care.—Dr. F. R. G. Heaf and Dr. J. B. McDougall (Joint Conveners).

Finance and Publicity.—The Officers of the Council, with Professor Sir W. W. Jameson.

Milk.—Dr. C. O. Hawthorne (Convener).

Nursing.—Dr. Esther Carling (Convener).

Overseas.—Dr. S. Vere Pearson (Convener).

Post-Graduate Study.—Dr. F. R. G. Heaf (Convener).

Organisation of Tuberculosis Service in War Time.—Dr. J. Watt (Convener).

Infection and Books.—Professor W. H. Tytler (Convener).

Major Surgical Treatment of Pulmonary Tuberculosis.—Mr. J. E. H. Roberts (Convener).

Institutional Treatment of Children Suffering from Pulmonary Tuberculosis.—Dr. Peter W. Edwards (Convener).

The Honorary Secretary reported that in all probability there would be a visit from French tuberculosis physicians to this country in 1940, but that a date could not yet be fixed.

An interesting discussion followed on the presentation of a memorandum on Fellowships, Grants, Scholarships, etc., for Investigation into Problems concerning Tuberculosis, presented by the Honorary Secretary. It was decided that the memorandum be referred to the Finance and Publicity Committee of the Council and that representation be made to the Medical Research Council that it would be of assistance to research in tuberculosis if the membership of its Tuberculosis Committee had a larger representation of clinicians and of the tuberculosis service maintained by local authorities.

Dr. G. Lissant Cox, in moving "That consideration be given to the recent Report on Tuberculosis in Wales," outlined some of the findings of the report and raised two questions in particular—whether certain of the defects found in Wales were not in fact repeated elsewhere in England, Scotland and Ireland, and whether action should not have been taken by the Ministry of Health as the result of survey reports. Dr. D. A. Powell (Welsh National Memorial Association) gave an interesting survey of the sequence of events leading up to the enquiry and detailed many of the difficulties confronting a number of local authorities in Wales in undertaking their legitimate responsibilities in prevention.

The Council decided that Dr. D. A. Powell and Dr. G. Lissant Cox be appointed to consider the Welsh Report in detail and report to the Joint Tuberculosis Council how far the lessons emanating from the enquiry may be applied to the country as a whole.

The Council next gave attention to a motion by Dr. F. R. G. Heaf (London) asking for a review of the definition of the term "quiescence" in tuberculosis. A general desire was expressed by members that other terms should also be re-defined, and a Committee, with Dr. Heaf as Convener, was appointed to revise the definition of a number of terms in common use.

The Convener of Post-Graduate Studies reported that further courses were contemplated for General Practitioners, Radiologists and Tuberculosis Physicians in London and Lancashire in the autumn of this year.

Permission was granted to the *British Journal of Radiology* for the publication of the recent report of the Skiagraphic Committee of the Council.

The next meeting will be held at the School of Hygiene, London, on November 18, 1939.

TUBERCULOSIS ASSOCIATION

THE Provincial Meeting of the Association was held in Cambridge on March 30, 31, and April 1, 1939. The President, Dr. G. T. Hebert, took the chair.

Dr. De Winter (Bruges) gave the opening address in the absence through illness of Professor Sebrechts, and he spoke on "Apicolysis by Plombage with the Pectoral Muscles in the Surgical Treatment of Giant Cavities." He reviewed the technique and the results at Bruges from 1926 to 1938. In aiming at obtaining selective collapse by this method the first stage was to free the pectoral muscles through an anterior incision, securing a vascular pedicle, subsequently performing an apicolysis and filling the dead space with the muscle graft. Resection of the upper ribs might be required sometimes in addition. This type of operation was most suitable for treating giant cavities, and it could be done bilaterally and in some patients with a pneumothorax on the opposite side. The speaker showed numerous lantern slides illustrating the results, and then went on to deal with the treatment of tuberculous pyopneumothorax with a bronchial fistula and secondary infection. He considered that in skilled hands a drainage tube could be inserted and a thoracoplasty of the upper four ribs performed at the same time, the final closure of the empyema cavity being done later. Judged by the standards of an obliterated cavity, no sputum and ability to return to work, over half the favourable cases treated by the plombage technique could be regarded as cured after follow-up for seven years.

Opening the subsequent discussion the Chairman mentioned the difficulty that using solid media to fill the dead space in apicolysis might make subsequent X-rays difficult to interpret. He was curious as to the fate of the muscle in the Sebrechts type of operation. Other speakers referred to the minimal amount of shock which followed this type of operation, and to the extent to which the muscle underwent fibrosis. Replying, Dr. De Winter said that he was not in favour of extrapleural pneumothorax on the ground that the creation of an artificial cavity was a surgical heresy. Muscle used in the plombage treatment contracted to about 40 per cent. of its original volume.

The rest of the first day's programme consisted of the presentation and discussion of problem cases.

On the second day Mr. Barrett (London) gave a paper on "Tuberculosis of the Thoracic Wall." He spoke of the difficulty of understanding the pathology of these cases, which accounted for the common failure of the treatment by opening the abscess cavity and removing part of the under-

lying rib. The rib is not always involved. The bovine bacillus is responsible for a large number of these cases, which seem to be less common in America than in this country. He considered that the cases properly came under four groups: (1) Those with infection from the lung or pleura, empyema necessitatis or needle-track infections, or infection of a thoracoplasty or extrapleural space; (2) those with tuberculosis in the plane of the endothoracic fascia; (3) tuberculosis of the ribs, sternum, and costal cartilages; and (4) tuberculosis of the breast. An interesting discussion followed, and this was then followed by a paper by Dr. F. R. G. Heaf (London) on "How far should the Individual be considered in forming a Tuberculosis Scheme?"

The afternoon was taken up by visits to Papworth Village Settlement, Strangeway's Laboratory, Addenbrooke's Hospital, and Ely Cathedral.

On Saturday there were three papers before the Annual General Meeting of the Association. Dr. Brian Thompson (Clare Hall) and Mr. G. S. Evans (Heatherwood) spoke on "Tuberculous Cervical Adenitis." The former referred to the reduced incidence of the condition in civilised communities, and that in England this reduction was mainly among the middle classes and could not easily be related to any change in their milk supply, as had been thought to account for a similar reduction in the United States. He thought that involvement of the deep cervical nodes resulted from a latent infection in the tonsil, and that involvement of other groups of glands was secondary to these. Initial involvement of the supraclavicular or axillary nodes he thought was due to intrathoracic tuberculosis, possibly by transpleural extension. Hæmatogenous infection of lymph nodes was rare, and only 2 per cent. of cases gave a contact history. Among his patients, 54 out of 324 developed phthisis, and 13 of these died. Mr. Evans stressed the importance of previous sepsis in lymph nodes as a contributory factor lessening resistance. Reviewing the diagnosis, he considered that when investigation had excluded other possibilities, chronic painless enlargement of the cervical lymph glands should be regarded as tuberculous until proved otherwise. He then went on to discuss treatment, stressing the importance of attention to the general health and to septic foci, and that conservative measures should be persevered with if the size of the glands responded favourably.

The final paper was on "The Radiological Examination of the Larynx" and was given by Mr. Scott Stevenson. He referred to the neglect of this subject in this country, and he then proceeded to illustrate a very interesting paper with a number of diagrams and X-rays. Absence of deformity of the laryngeal ventricle excluded severe inflammations or tumours of the cords. Tumours may encroach on the air space of the vestibules, ventricles or subglottic region: if benign, they usually give a sharp outline; if malignant,

a hazy outline. Radiographs are particularly useful in detecting extension downwards of a growth and in following radiotherapy. In laryngeal tuberculosis they were less valuable, though in advanced cases they gave characteristic appearances. In the subsequent discussion Mr. Ormerod (London) showed some very interesting tomograms of laryngeal conditions, and the President noted that this method appeared to give more information than a straight lateral X-ray.

At the Annual General Meeting, which followed, the President was re-elected for a second year, and Dr. N. Tattersall was elected Vice-President. Dr. J. L. Livingstone, Dr. E. C. Wynne-Edwards, Dr. F. T. Clive, Dr. M. O. Raven, and Mr. R. C. Brock were elected to the Council.

The next Provincial Meeting of the Association is to be held in Oxford in 1940.

YORKSHIRE TUBERCULOSIS SOCIETY

THE Yorkshire Tuberculosis Society, which was resuscitated two years ago under the presidency of Dr. N. Tattersall, has just completed a successful session, and has held its Annual Meeting at Killingbeck Sanatorium, at the kind invitation of Dr. W. Santon Gilmour.

Four meetings are held during the winter, and the programme just completed has been one of great interest and variety. (1) Dr. Peter Edwards gave a stimulating paper on "Methods of Obtaining Complete Collapse of the Lung," and demonstrated particularly the necessity for and the excellent results of adhesion-cutting. (2) Dr. John T. Ingram, in a most able paper on "The Diagnosis and Treatment of Tuberculous Skin Lesions," proved that, in spite of the chronicity of the lesion, there is great hope for lupus if patient and persistent treatment is carried out. (3) The orthopaedic aspect of tuberculosis was satisfied in a paper by Dr. H. L. Crockatt on "The Pros and Cons of Arthrodesis," and, although he admitted to a conservative attitude to this question, the speaker agreed that cases of non-bony union should be assisted by open operation. (4) Two short papers on (a) "The Diagnosis of Abdominal Tuberculosis in Children," by Dr. Margaret Sharp, and (b) "Cases of Transient Positive Sputum," by Dr. S. P. Wilson, provided much discussion among the members, and proved that in the society there is considerable vitality and determination to "carry on."

S. R. WILSON.

REVIEWS OF NEW BOOKS

Synopsis of Pulmonary Tuberculosis. By JACOB SEGAL, M.D., Physician in charge of Fordham Hospital Tuberculosis Clinic, New York; Associate Visiting Physician, Riverside Hospital, New York; Associate Visiting Physician, Bronx Hospital. London: Humphrey Milford, Oxford University Press, 1939. Pp. 150. Price 10s. 6d.

There must be many practitioners and students who wish to gain more information about pulmonary tuberculosis than is afforded by the average textbook, and who find it difficult and wearisome to sort out the important facts from large volumes which deal exhaustively with every aspect of this vast subject.

To such, this book is to be strongly recommended; it is written in an attractively free style, which, coupled with the concise arrangement of its material, makes it easy reading. The illustrations with X-ray plates are plentiful, and adequately reproduced. The chapter on treatment rightly comprises more than half the space, and the various forms of collapse therapy are clearly dealt with, avoiding undue description of surgical procedures. It is, however, to be especially noticed that the author never fails to emphasise the great part which should be played by rest—"absolute rest in bed, without compromise"—in the treatment of tuberculous patients. The more widely this fact is grasped by practitioners, the more easily will their patients realise that collapse therapy can never be a satisfactory substitute for the sanatorium regime. There are a few passages which undoubtedly will not go unchallenged; for example, "most of the spontaneous pneumothoraces of unknown origin . . . are probably due to a broken-down stray tubercle on the visceral pleura" is a statement with which many will disagree. But the author makes it clear at the outset that the book is no more than its title suggests—a synopsis. For this reason, it is bound to be dogmatic in places, and this is to be welcomed in such a book rather than deprecated, especially when it is realised that the views expressed in it represent twenty-five years' experience, and are, therefore, on the whole as authoritative as any with which we are likely to meet.

The foreword is written by the late Dr. Poll Coryllos, and we should like to be associated with him in saying: "I believe that books of this sort should be read by every practitioner and every medical student."

Brompton Hospital Reports. Vol. VII. 1938. Pp. 207. Published by the Research Department of the Brompton Hospital. Price 5s. (5s. 6d. post free) from the Hospital Secretary.

Volume VII. of these Reports maintains the traditions of this valuable publication and provides evidence, if any be needed, of the active clinical research that is being done at the hospital.

All the communications except two have been published elsewhere: the two exceptions will attract special notice. Mr. Brock publishes his experiences with the largest series recorded in this country of the division of adhesions (442 consecutive operations). This is an outstanding analysis and a fine piece of firm, convinced writing. Mr. Brock will have the sympathy of many physicians and surgeons about his advocacy of this operation, considered by the reviewer to be the most valuable of all (after artificial pneumothorax itself) in the surgical treatment of pulmonary tuberculosis. There can be no doubt that many inefficient, non-collapsing pneumothoraces could be made effective by a more extended use of this method. A careful reading of this paper should reassure those whose unjustified timidity is removing the chance of recovery from many patients. The article is well reasoned and no dogmatic statements are made without proof of their logical basis. His claims for the advantage of the galvano-cautery over the diathermy knife and of the two-cannulæ over the one-cannula method will convince most readers. His explanation of adhesion formation and of their different types should be considered carefully.

The other article not previously published is by Dr. W. D. W. Brooks on Induced Selective Collapse in Pneumothorax Therapy. His method of treating cavities by bronchial occlusion producing atelectasis has already attracted considerable attention; here a description is given of ten patients treated by his balloon: selective collapse was obtained in six with immediate closure of persistent cavitation in three, and the reasons for the failure of the method in the other four cases are given.

The remaining articles furnish a valuable collection of papers and show that the Brompton physicians are not allowing the dramatic interest of chest surgery to eclipse the medical aspect of chest diseases. The scholarly work of Dr. Lee Lander and Dr. Davidson on the *Ætiology of Bronchiectasis*, on being re-read by the reviewer, seemed more convincing than ever, though some link still seems to be missing in the chain of evidence. Dr. Clifford Hoyle again shows the importance of being familiar with and able to recognise chronic miliary tuberculosis, and another paper by him on cardiac emergencies and a modest description of the fact that 339 patients attended Dr. Hope Gosse's Cardiac Department reminds us that other organs besides the lungs are being cared for in this famous hospital. The presentation of Dr. Burrell's last three papers is a sad reminder of our great loss and of his previous valuable contributions to the Brompton Reports.

The year 1938 was important because of the presentation to thoracic physicians and surgeons of the revived practice of extra-pleural artificial pneumothorax, and many of these operations are being carried out in parts of England and Wales, though the final place of the operation in collapse therapy has not been determined. The opinions of Mr. Roberts and Mr. Brock are therefore of special interest at this time and should be read carefully by any who have not heard these two surgeons speak on the subject. The most difficult problem is to decide upon the indications for this operation, and it is clear that thoracic surgeons do not entirely agree on this point; at all events it is becoming clear that an extra-pleural pneumothorax is not necessarily indicated when an urgently required intra-pleural pneumothorax has been impossible to achieve because of obliteration of

the pleural space, although Mr. Brock suggests that such is the case. If the cavity and disease are apical certain patients require a Semb thoracoplasty, while others, especially where there is reason to believe that after healing has occurred re-expansion of the lung may be allowed to take place, or where the general condition or the state of the other lung makes the operation of thoracoplasty too risky, will need an extra-pleural artificial pneumothorax. The difficulties and complications (which in the opinion of the reviewer are being over-estimated in many parts of the country) are well and fairly described and the after-treatment (perhaps the most important part of the procedure) well explained. Some thoracic surgeons now think that only the larger of the post-operative sero-sanguineous effusions into the space require aspiration, as repeated aspiration may cause infection. The performance of this operation while an artificial pneumothorax is still in progress is discussed and the opening of one space into the other (first performed by Brock) described. The reviewer wonders if this conversion operation may not preserve for itself a permanent place in collapse therapy.

The paper on the pathology and treatment of carcinoma of the bronchus by Mr. Ormerod should stimulate the use of radon seed therapy as a palliative for carcinoma of the bronchus where dissection pneumonectomy is impossible. Dr. Sparks contributes a well illustrated paper on the radiology of and surgery of Inflammatory Lesions of the Lungs, which shows once more the great debt of gratitude the clinician should feel to the radiologist, for without his aid we should indeed be in the wilderness.

Modern Treatment Year Book, 1939. Edited by CECIL P. G. WAKELEY, D.Sc., F.R.C.S., F.R.S.E., F.A.C.S., F.R.A.C.S.(Hon.); Fellow of King's College, London; Senior Surgeon, King's College Hospital. London: The Medical Press and Circular. Pp. 355. Price 10s. 6d.

Modern Treatment Year Book has firmly established itself as an annual. It comprises medicine, surgery and gynaecology, together with many specialised offspring such as tropical medicine, neurosurgery, epidemiology, etc.; and the authors are drawn from teaching and non-teaching hospitals alike, in this country and in the United States.

The choice of subjects, like the choice of authors, is a good one, including, as it does, many common conditions, together with a few rare ones. The treatment of these common diseases by acknowledged experts forms the most valuable part of this book. A few of the chapters, such as those on strabismus and pituitary diseases, might have been simplified. The surgical technique of splenectomy and auditory nerve tumour removal is surely out of place in a book of this kind.

It is interesting to compare the treatment of various conditions today with that of yesterday. Ulcerative colitis, as described by Dr. Tidy, has changed little in its treatment during the last twenty years. On the other hand, the use of sulphanilamide in gonorrhœa and convalescent serum in measles marks a new era in the control of these scourges.

The last third of the book comprises a "pitfalls in diagnosis" series, and it makes an invaluable aid to the correct approach and diagnosis of a

condition as described by men who have been dealing with just such clinical problems all their lives. The first half of the "pitfalls" series is devoted to swellings in various parts of the body, and each chapter explains in simple terms the possible diagnostic traps and how they may be avoided.

The last half-dozen articles describe the diagnostic pitfalls to be met with in some common chest conditions.

How often do we see cases of early pulmonary tuberculosis or carcinoma of the lung labelled bronchitis? It is an all-too-common error, but after reading Dr. Chandler's article on acute bronchitis we should never make the mistake again.

Again, we are all familiar with the case of advanced bilateral phthisis. "Pitfalls in the Diagnosis of Pulmonary Tuberculosis" tells us exactly why these cases should not be overlooked in the early stages, and stresses the importance of radiological examination of the lungs in all doubtful cases.

Bronchiectasis, as Dr. Williams so ably points out, is often an unsuspected cause of mild, recurrent symptoms such as cough, pyrexia, and pleural pain, especially in children. The use of lipiodol has made the diagnosis much easier, but no mention is made of the crico-thyroid route, the easiest and certainly the most accurate method of introduction. The collapse theory of the production of bronchiectasis has recently superseded the old idea of pressure and traction, but no textbook can be completely up to date in these days of rapid advance.

Intrathoracic tumours have recently acquired an unenviable reputation owing to their undoubted increase during the last ten years. Far and away the most important of them is bronchial carcinoma. Dr. Punch rightly gives most space to a consideration of its signs, symptoms, and treatment. He does not, however, mention the bronchial adenoma. The similarity in signs and symptoms to its malignant brother, associated with its very different prognosis, makes it worthy of mention in spite of its rarity.

The chapter on empyema by Mr. Roberts is wholly admirable. The early diagnosis and treatment of this condition still leaves a great deal to be desired. He gives two reasons for this: Firstly, it is not sufficiently realised that breath sounds can be conducted even better through solid lung than through air-containing lung, provided that the bronchus is patent; his assertion that bronchial breathing and bronchophony are possible in lung collapsed distal to a bronchial obstruction is not generally accepted. Secondly, the drainage tube must be left *in situ* until the underlying pleural space is completely filled.

Finally, there is a chapter on radiology of the chest. The various typical pictures, if X-rays of lungs can ever be said to be typical, are well described by Dr. Davies, and the most likely pitfalls uncovered. He makes no mention of residual lipiodol in the alveoli as a possible pitfall, nor does he stress sufficiently the value of the lateral film.

Mr. Wakeley in this 1939 volume is to be congratulated on collecting material which should be of value to general practitioner and specialist alike. He has written two of the chapters himself, and both of them stand out in a series of articles which are full of invaluable tips.

Report of the Medical Research Council for the Year 1937-1938. London: H.M. Stationery Office, 1939. Price 3s. 6d. net.

This Report always makes interesting reading and covers the whole range of medicine. Work has continued during the last year in such diverse fields as parasitology, bed-bug infestation, hormones, tropical diseases, cancer, virus diseases, chemical transmission of nervous effects, chemotherapy, pulmonary diseases, and numerous other subjects.

In the field of pulmonary diseases various advances have been made from different angles. In Scotland, the incidence of bovine pulmonary tuberculosis has been under survey. It was found that 4.7 per cent. of town cases and 9.1 per cent. of country cases of human pulmonary tuberculosis yielded the bovine strain of tubercle bacillus in the sputum. Over 200 cases of pulmonary tuberculosis due to the bovine strain have now been recorded in Great Britain, and further work will doubtless increase this number considerably. The condition is far commoner in Scotland than in England.

At Guy's Hospital, Dr. Poulton and his co-workers have extended clinical observations and treatment of respiratory diseases by allowing patients to breathe dried air given in a tent. Analysis has also been made of temperature and humidity curves throughout the country at different centres, in relation to the hypothesis that atmospheric dryness may be the important factor in the open-air and mountain treatment of tuberculosis.

The observation that voles are susceptible to tuberculosis promised to open a wide field for investigation. The further reports now suggest that the myco-bacterium responsible for the disease in voles is indeed a tubercle bacillus of a hitherto undescribed strain. It has been shown that the vole is more susceptible to the bovine than to the human or avian strain, but what we would like to know now is the pathogenicity of the vole strain for cattle, particularly in view of the widespread distribution of the vole.

Chronic pulmonary disease among coal-miners has also engaged attention. In recent years it has become apparent that coal-miners are subject to chronic pulmonary disease of a disabling nature which does not come within the accepted definition of silicosis. A condition occurs which clinically resembles silicosis, but is radiologically different from it. In this condition nodulation is absent, but there is instead a variety of other shadows, the significance of which, in relation to the occurrence and progress of disability, is not clearly understood. The scientific problem is one of great difficulty and research of this kind is necessarily slow, but there is every reason to hope that interesting new information will be yielded when all the evidence now carefully collected is available for review.

Another condition under investigation is cancer of the lung, particularly the relation of dust to its aetiology. It seems probable that the action of organic carcinogens in modern road-dust must be reinforced by some properties of the mineral basis; and the chemical examination of various mineral dusts which have been associated with a high incidence of lung cancer in man suggests an association of silica and iron oxide as a common feature of their composition. Other dusts, such as nickel dust, and samples from the Joachimstal mines, are still under examination.